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NRL Memorandum Report 2265

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Special Information on High-Frequency Radar

Part XV

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ABSTRACT

(Unclassified)

A good real time description of the ionospheric transmission path will be essential for effective operational use of the radar. The major purpose of this experiment is to explore analysis techniques that use echoes from the earth surface as a base to form a transmission description and thus to optimize radar operation and to evaluate radar performance. The essential step herein is to determine how to provide an adequate description of the transmission medium. The extent to which this description can be accomplished with only radar outputs will be examined and the necessary auxiliary ionospheric describers will be defined.

PROBLEM STATUS

This is a final DVST Experiment Design Report, one of a group; work continues on others in the group.

AUTHORIZATION

USAF's ESD (MIPR) FY 762071-00005
to the Naval Research Laboratory, dated 1970
NRL Problem Number 53R02-42

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CLUTTER CHARACTERISTICS OF THE AN/FPS-95

DVST EXPERIMENT #102

([redacted])

1.0 PURPOSE OF EXPERIMENT

([redacted]) A good real time description of the ionospheric transmission path will be essential for effective operational use of the radar. The major purpose of this experiment is to explore analysis techniques that use echoes from the earth surface as a base to form a transmission description and thus to optimize radar operation and to evaluate radar performance. The essential step herein is to determine how to provide an adequate description of the transmission medium. The extent to which this description can be accomplished with only radar outputs will be examined and the necessary auxiliary ionospheric describers will be defined.

1.1 ([redacted]) The principal first objective is to make comprehensive observations of the echoes received from the earth and to record these "clutter" returns in a form amenable to analysis.

1.2 ([redacted]) The records of paragraph 1.1 will be processed to give a definitive description of the average earth surface scattering coefficient as a function of operating frequency, radiation angle, season and geographical location.

1.3 ([redacted]) The records will be processed and displayed in a form to permit exposing landmarks and calibration point locations. This work employs both amplitude and frequency characteristics of echoes as identifiers, however, doppler frequency identification appears to be more important.

1.4 ([redacted]) With the aid of scattering coefficients determined in paragraph 1.2 the potential for real time path loss determinations will be studied and demonstrated.

1.5 ([redacted]) The capability of continuously making transmission path descriptions in quasi real time will be ascertained. The goal here is to enable management procedures to give the optimum illumination for any search task. The procedure will be to use the radar clutter returns and to ascertain the necessities and desirabilities of other ionospheric describer inputs. The other describers should include the following:

(1) Long-term and short-term predicted ionization profiles
(2) Vertical sounding (h' vs f) at radar site
(3) Oblique soundings
(4) Oblique backscatter versus frequency soundings at site

[redacted]

[redacted]

(5) Manmade "landmarks" - both intentional and noncooperative
(6) Natural landmarks, i.e., bodies of water, mountains, cities, etc.
(7) Remote vertical and oblique soundings

2.0 EXPERIMENT DESCRIPTION SUMMARY

([redacted]) In gathering the data it will be essential to operate the radar in a nonstandard fashion. Specifically it is necessary to preserve the clutter return, maintain a good range resolution, and minimize range ambiguities. For example, use a 250-μs pulse, a 4-kHz sample rate, 20 pulses per second and a final bipolar video offset of 5 Hz. The data will be recorded on tape. Processing will be by computer.

2.1 ([redacted]) Operate and tape record the radar echo received from the surface of the earth. Cover one-half the available azimuth one day and the other half the next, both horizontal and vertical polarization, and enough frequencies (estimate up to four) to provide a good energy density out to maximum one refraction distance. Figures 1 and 2 are examples of expected responses, parametric in frequency, based upon the long-term ionosphere predictions. The Appendix contains the analysis from which Figures 1 and 2 are derived. Similar sets will be made before each data run (Ref. 1). Table I provides an example of the guides that need be constructed; these are based on Figs. 1 and 2. The frequency set selection will be adjusted by an oblique backscatter sounding. Collect 2-minute data samples giving 7 azimuths x 2 radiation angle patterns x 2 minutes equals 28 minutes per frequency. If four frequencies are used, a complete sample will take about two hours. The schedule for this data set is two samples per day for four days in each season. Collection times should be in the stable periods, say between 0800-1100Z for day and between 2000-2300Z for night. Thus about 64 hours of data will be taken.

([redacted]) On one day for each season fill in the rest of the day with similar data taken on headings of 030° and 100°. This will add about 80 hours of data.

2.2 ([redacted]) Additional time is required for exploring capabilities for using manmade targets as reference marks, 30 hours is estimated. The approach for cooperative targets will depend upon their characteristics and hopefully this data will be included in the data set described in 2.1.

2.3 ([redacted]) High-gain antenna systems with their transmitters active should provide discernible targets and this should be explored. This concept is detailed in reference 2. However, the general idea can be outlined. Most HF transmitters constitute a nonlinear termination to the antenna they are using. If a radar signal impinges on the HF station antenna the intermodulation frequencies consistent with the radar frequency and the broadcast station frequency will be generated with the third order one being a good candidate.

Azimuth (Degrees)	Frequency (MHz)			
023	f_{11}	f_{12}	f_{13}	f_{14}
030	f_{21}	f_{22}	f_{23}	f_{24}
037	f_{31}	f_{32}	f_{33}	f_{34}
044	f_{41}	f_{42}	f_{43}	f_{44}
051	f_{51}	f_{52}	f_{53}	f_{54}
058	f_{61}	f_{62}	f_{63}	f_{64}
065	7	11	14	--

TABLE I. Summer night frequency complement that is estimated to give adequate power density over all ranges. The set for 065 has been selected by inspection of Figures 1 and 2.

For example, if the HF broadcast station carrier is at 9 MHz and the radar at 8 MHz, the third order intermodulation products will be:

$$2f_1 - f_2 = 10 \text{ MHz}$$
$$2f_2 - f_1 = 7 \text{ MHz}$$

These signals will have the radar PRF and will not be obscured by clutter. It is expected that the third order intermodulation product will be down no more than 10 dB from the incident radar signal, thus if the broadcast station is employing a high-gain antenna directed toward the radar, signal levels should be quite adequate. Although broadcast station frequency stability will be a problem in signal processing, certain radio Moscow stations are quite stable. Of course frequency selection should be such to minimize interference on the third order intermodulation product frequencies. The intent is to demonstrate this capability and to indicate the application to both calibrating the radar and locating HF broadcast stations.

2.4 ([redacted]) The total operating time estimate is 172 hours.

3.0 THEORY

3.1 ([redacted]) The earth diffuse backscattering coefficient, σ^{o}, is assumed to be fairly constant with time for cell sizes of 7 degrees by 20 nmi.

3.2 ([redacted]) Backscatter from seas will be principally resonant (Bragg) where Fig. 3 gives the doppler displacement (Ref. 4) of returns that are duochromatic. Backscatter from land will consist of monochromatic reradiation of the impinging frequency. Frequency spreading or shift can be attributed to the transmission path.

3.3 ([redacted]) There may be localized regions where the size of the scattering coefficient changes enough for recognition (for example, mountain ranges).

3.4 ([redacted]) The transmission medium (ionospheric path) can be adequately represented by nominal midpath h' versus f traces (or true height profiles) consisting of four refracting regions (E_s, E, F_1 and F_2) with each region being described by a number triple (height of ionization maximum, thickness of parabola used to approximate density function, and plasma frequency of maximum) plus a two-point tilt description (Ref. 1).

3.5 ([redacted]) For the propagation analyses the assumption will be that virtual paths for the ordinary low rays are sufficient.

4.0 SPECIFIC EXPERIMENTAL OBJECTIVES

4.1 <u>Specific Goals of Experiment</u>

4.1.1 ([redacted]) The first goal is to produce a processed data bank of earth backscatter observations and to present this as an album for study. Figures 5 and 6 examples.

4.1.2 ([redacted]) The second goal is to provide σ^o (f,ϕ,Az,R), using nighttime amplitude vs time delay, available ionosphere describers, and the RADAR program in an adaptive mode.

4.1.3 ([redacted]) The third goal is to expose natural targets. Examine album of contour plots for natural targets that can be identified by doppler - that is, water surrounded by land or land surrounded by water. Prime targets are Black Sea, Caspian Sea, Aral Sea, Baltic Sea, Novaya Zemlya and the Barents Sea - Scandinavian Peninsula boundary. Figure 4 charts the land and water in the primary coverage region. Select some of the better data sets and produce a radar derived land-sea chart. This exercise should demonstrate the potential for calibrating the radar by these natural targets.

([redacted]) Make a special study to determine if Lake Balkash can be used as a geographic locator.

4.1.4 ([redacted]) Test ability to detect high gain antennas being used to radiate toward England. (Ref. 2)

([redacted]) In all above work test beam splitting for azimuthal measurements.

[redacted]

4.1.5 ([redacted]) A fourth goal is to test the ability to estimate remote ionosphere or transmission path.

(a) Start from radar location h' - f vertical sounding description of ionosphere and using long-term trends in spatial variations, predict backscatter amplitude versus time. Observe real backscatter amplitudes at lower frequencies and correct f_oE_s to coincide with observation. View high frequency returns and correct f_oF_2 for coincidence. These two adjustments are expected to deliver a reasonable similarity between the "predicted" backscatter shape and the observed. Where the divergence is great, f_oF_1, tilt angle modification, and $h'F_2$ adjustment should be tried. Wherever available the deduced remote h'f adjustment should be tried. Wherever available the deduced remote h'f traces can be compared with h'f traces measured out in refracting region. Real path loss can be estimated from displacement of observed amplitude from predicted. Reference 3 provides an actual exercise with the MADRE radar and can be used as a guide example.

(b) Now use R' to "landmarks" to adjust appropriate ionospheric region h' values and the landmark amplitude (where calibrated) to adjust loss. After these adjustments, test improvement in predictions and observations; in particular compare the derived remote ionosphere description with all those available from appropriate remote areas.

(c) Use the above remote transmission path description on several azimuths to define a transverse tilt and compare with observed azimuthal deviation of "landmarks."

4.1.6 ([redacted]) The fifth objective is to develop techniques that can be used to provide a running "real time" description of the transmission medium and to indicate how radar management can be aided.

4.2 Detailed Description of Analyzed Outputs

4.2.1 ([redacted]) The analyzed output forms can be best described by example. Figure 5 shows earth backscatter exhibits for one operating frequency, azimuth, and radiation angle function. CALCOMP plots can be used if desired, see Fig. 6.

4.2.2 ([redacted]) For the first σ^o approximation, select nighttime average amplitude versus time delay samples that are most free of multimode illumination and select the values of $\sigma^o = \sigma^o(AZ)$ that gives best fits. See Figure 7 for an example. Determine if a functional relation with radiation angle, frequency and geographical location can be discerned.

4.2.3 ([redacted]) Use night-determined σ^o with daytime backscatter amplitude versus R' and propagation analysis to determine path loss. (See Fig. 8.)

4.2.4 ([redacted]) Catalog the recognizable natural targets indicating measurable identifiers; that is, doppler or amplitude or both. Figure 9 gives an example of target identification. Produce radar derived charts that will show how natural targets can be identified and used; see Figure 10.

4.2.5 ([redacted]) The requirements for delivering an acceptable description of the transmission medium will be a major desired output. As laid out, the transmission medium description will be in the form of an h'-f function or functions and a path loss function.

4.2.6 ([redacted]) An end product or output of the effort will be computer programs that can be used in frequency and scan management of the radar.

5.0 DATA REDUCTION AND ANALYSIS

5.1 Data Analysis Procedures

5.1.1 ([redacted]) First the analyst should construct a data bank of earth backscatter observations using the computer program described in 5.2.2 for spectrum analysis. The information for this data bank should take the form of backscatter amplitude versus range traces with selected portions further analyzed to produce contour plots of the doppler/range space. Then using the prediction program described in 5.2.1 combined with available ionosphere descriptors the analyst should determine how backscatter cross section varies as a function of radar frequency and angle of incidence for various types of terrain. Using the same computer program to assess propagation geometry he should then map backscatter cross section as a function of azimuth and range from the radar site. This mapping will be used later to expose natural targets.

5.1.2 ([redacted]) The azimuth/range backscatter cross-section map produced above should be augmented by producing contour plots in doppler range for selected portions. This should allow differentiating land and sea backscatters on the basis of doppler characteristics. A special study should be made to determine feasibility of using land-sea boundaries (especially Lake Balkash) to provide ground range calibration for the radar.

5.1.3 ([redacted]) Additional range calibration information may be gained from periods of special observation of foreign broadcast stations. Data taken during these periods should be analyzed closely for characteristic returns. Ground ranges determined should be compared with those found in 5.2 and in other experiments.

5.1.4 ([redacted]) The analyst should use the procedure outlined in 4.1.5 to test the ability to estimate remote ionosphere or transmission path.

[redacted]

5.2 Computer Program Specifications

5.2.1 Function

([redacted]) Prediction of backscattered signal levels and remote ionospheric sensing.

5.2.1.1 Inputs

([redacted]) (1) Zurich smoothed sunspot number
(2) Month
(3) Time (Greenwich)
(4) Transmitter frequency (kilohertz)
(5) Peak power (megawatt)
(6) Pulse width (microseconds)
(7) Antenna azimuth (degrees)
(8) Antenna polarization (vertical or horizontal)
(9) Noise level expected (optional), (dB below one watt)
(10) Deviation from median ionosphere (percent for each)
(11) Target cross section (square meters)

Inputs 9, 10 and 11 are optional.

5.2.1.2 Processing

([redacted]) The NRL HF OHD model is based upon the large volume of ionospheric data compiled over the years by the Institute of Telecommunication Sciences and is in the evolutionary line of the methods and computer models used in the analysis of communication systems. However, the emphasis in the NRL OHD model is on the description of the ionosphere along a great circle covered by the transmitted signal rather than the description of the electromagnetic environment at a single point as is the purpose of many other models. A detailed description of the program is given in following paragraphs.

([redacted]) The model is intended to predict the performance of HF radar systems that depend upon ionospheric propagation. The prediction calculations can be summarized in three steps: the first step is to describe the ionosphere; the second is to describe the area coverage of the sky-wave radar; and the third step is to describe the power densities in the area covered as a function of radar and ionosphere parameters. The ionosphere is described by virtual height ionograms given as a function of vertical sounding frequency (h'-f). The program uses two such ionograms at each expected reflection area. (One area is used for one-hop modes, another for two-hop modes.) The virtual heights are used because this is what is actually recorded; the ray paths are easily calculated using them and the difficulties arising in reducing virtual heights to true heights can be ignored.

[redacted]

If measured ionograms are available these can be used; otherwise predicted ionograms are synthesized from available ionospheric indices by a method reported in Reference 1. The true height is given as a function of electron density using segments of parabolas for three layers: the regular E-layer, the Fl-layer, and the F2-layer. This representation is used because of the wide variety of possible electron density profiles that may be approximated and because of the ease of the calculations. In order to describe a layer, three parameters are needed: the height of maximum ionization, the semithickness of the layer, and the critical frequency. The critical frequencies of the E-layer and of the F2-layer are calculated from numerical maps. The critical frequency of the Fl-layer is given by an empirical formula. The height of maximum ionization of the E-layer is taken as 130 kilometers (km) and its semithickness as 20 km. This puts the bottom of the E-layer at 110 km which is a bit high for the true height of the layer, but as virtual heights are used in all the calculations, this height will account for bending of the rays in the region below the E-layer and give virtual heights which agree with measured ionograms. The height of the Fl-layer is given by an empirical formula and its semithickness is taken as 50 km. The existing worldwide numerical maps of M(3000)F2 and a linear conversion formula are used to obtain the necessary estimates of h_pF2. This is then reduced to the height of maximum ionization by considering the parabolic retardation in the underlying layers. The semithickness is highly correlated with the height of maximum ionization; therefore it is obtained from a numerical map of the ratio of maximum height to the semithickness rather than from a separate numerical map of the bottom of the layer. The sporadic-E-layer is described by a critical frequency given from a numerical map. A detailed description of each of the parameters is given in the section pertaining to the program RADAR. The section on the subroutine GENRAT contains the mathematics used to generate the virtual heights. All of the ionospheric data are monthly median values. The monthly statistical distribution of f_oE_s at any location can be determined by use of separate maps of lower decile, median, and upper decile values of f_oE_s. The probability of propagation by E_s at a given operating frequency is estimated from the probability that the equivalent value of f_oE_s at the reflection point is equaled or exceeded. This probability is calculated by using a normal curve between the median (assumed equal to the mean) and the deciles. If the deciles are not equally spaced about the median this will result in a skewed continuous distribution which can be calculated using approximations of the normal curve. As the regular E-layer does not exhibit irregularities as complex as those associated with the E_s- and F2-layers, it is assumed to be very predictable (probability equal to .99) and its associated distribution is considered negligible. The Fl-layer is described as a function of the sun's zenith angle. It exists when the zenith angle is less than 70 degrees (probability equal to .99) and nonexistent otherwise (probability equal to 0). Since a study indicated that the distribution of values of MUF for an oblique path is a function of f_oF2 and not the M(3000)F2, only the

distribution of f_oF2's is used to generate the decile values. While the values of the critical frequencies used are median values, each of these can be adjusted to more closely match the hourly conditions that are indicated by observed sounder data.

([redacted]) The area coverage is obtained from the virtual height ionograms using geometric optic techniques. The use of geometric optics is appropriate for the frequencies considered and for the layer thicknesses used for the E-, and F1-, and F2-layers. A spherically symmetric ionosphere whose electron density varies only with height is assumed, and collisions and the magnetic fields are ignored. Under these conditions the ray paths can be found using Bouger's rule. This is in fact the "k-secant ϕ" law and is equivalent to the transmission curve methods. The effect of "ionospheric tilt" resulting from horizontal variations in the ionosphere can be exactly calculated only by integrating along the ray path. Since the structure of the ionosphere is not known precisely enough to justify such a procedure, the tilt is estimated using two ionograms by assuming an equivalent spherically symmetric ionosphere tilted from the sphere used to represent the earth. The mathematical details are given in the sections describing the subroutines TABEL and TILTY. However, the use of geometric optics is not appropriate for a thin layer such as the sporadic-E-layer, as wave theory indicates that the reflection does not cease abruptly at the critical frequency. This situation is approximated by calculating the rays as reflected by a mirror at a constant height and adjusting the power levels according to the methods described below.

([redacted]) The method used to calculate received signal level within the prediction model is similar to that used in other prediction models but includes a sporadic-E obscuration factor and a revised absorption equation when the transmission is via the regular E-layer or the sporadic-E-layer. A specific description of the ionospheric loss calculations is given in the discussion of program RADAR.

([redacted]) The information required to assemble an input deck is given in Section II, and a detailed description of the output is shown in Section III. The main program RADAR is described in Section IV and all subroutine functions and data used in RADAR are discussed in Sections IV-C and V.

5.2.1.3 Outputs

([redacted]) a. Ionogram pair for each bounce point, where each ionogram contains:

(1) Critical frequencies for all layers (MHz)
(2) Heights of maximum ionization for E, F1 and F2 layers (kilometers)
(3) Semithickness for E, F1 and F2 layers (kilometers)

[redacted]

b. Geometry and loss data for several rays for each mode. Information for each ray includes:

(1) Time delay (milliseconds)
(2) Takeoff angle (degrees)
(3) Ionospheric tilt angle (degrees)
(4) Virtual height of reflection (kilometers)
(5) Ground range (nautical miles)
(6) Ionospheric absorption (decibels)
(7) Antenna gain (decibels)
(8) Antenna beamwidth (degrees)
(9) Backscatter area (square meters)
(10) E_s obscuration factor (decibels)
(11) Received amplitude (decibels below one watt)

5.2.2 Function

([redacted]) Signal processing of the radar return with the Sigma 5 computer.

5.2.2.1 Input

([redacted]) (1) Digitized receiver output data
(2) Desired integration time
(3) Range extent desired
(4) Type of time weighting
(5) Display format
(6) Type of display

5.2.2.2 Processing

([redacted]) The program for processing the radar return must read the receiver output tape, interpret the tape header for radar operating information, and store receiver samples from selected ranges into range bins. After data have been read in for the desired integration time, the data in each range bin must be weighted for frequency side-lobe suppression and transformed from the time domain to the frequency domain with the fast Fourier transform. The transforms of the I and Q channels are combined to give signal energy as a function of doppler frequency for each range bin. The transforms of the Σ and Δ channels are combined to give azimuth error as a function of frequency for each range bin. The energy in each range bin is weighted as a function of frequency to give filtered energy as a function of range. This filtered energy as a function of range is averaged over a specified number of integration times to give an averaged filtered energy as a function of range.

[redacted]

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5.2.2.3 Output

([redacted]) The outputs of the processing program are plots on either the line-printer, the CALCOMP plotter, or the CRT displays.

([redacted]) The plots may be

(1) Signal energy or azimuth as function of doppler and range
(2) Doppler-gated energy or azimuth as a function of range
(3) Range-gated energy or azimuth as a function of doppler
(4) Doppler/range-gated energy or azimuth as a function of time

6.0 DATA REQUIREMENTS

([redacted]) Data will be required from the radar and other sounces.

6.1 Analysis and Description of Radar Data Requirements

([redacted]) The radar data required are the vertical soundings every 15 minutes and oblique backscatter soundings as required at times of data runs, raw data tapes with time information and power, beam position in azimuth and elevation, preferably on tape headers. Calibration levels should be on tapes.

6.2 Analysis and Description of Ancillary Data Requirements

6.2.1 ([redacted]) One set of ancillary data required are vertical soundings from the refraction regions (Norway, Sweden, Finland, Poland, Czechoslovakia, Hungary, Romania and eastern U.S.S.R.) or as near as possible for the times of observations. This data requirement should be placed on AF Weather Service; this information will be used in later analysis and is not required in real time.

6.2.2 ([redacted]) The information on high-gain antennas being used to broadcast generally toward the radar site is needed in real time with estimated location of antenna and a designation of operating frequency. The Foreign Broadcast Information Service is one possible data source.

6.3 Description of Log Data Requirements

([redacted]) Copies of the radar log giving time spans for frequency and antenna elements (directions) are required.

7.0 DATA COLLECTION

[redacted]

7.1 Determination of Initial Conditions

7.1.1 ([redacted]) No initiation conditions are required as this experiment will be performed on a scheduled routine basis throughout the year. However, collection times should be in the stable periods, say between 0800-1100Z for day and between 2000-2300Z for night.

7.1.2 ([redacted]) For each season scan tables will be prepared from analyses as shown in Appendix A. The objective is to obtain good illumination over the primary coverage zone (500-2000 nmi) on all azimuths using a minimum of frequencies. It is estimated that four frequencies (at any one time and bearing) will be sufficient and that three frequencies will often suffice. Coverage should be predicted on several bearings (say extremes and center) and a decision made as to the number of different bearing predictions required. It is expected that frequency tables prepared from long term data will be adequate; however the experiment conductor should be prepared to modify as required.

7.1.3 ([redacted]) Frequencies used should have interference levels low enough that the processed data shows a maximum clutter-level-to-noise ratio of at least 40 dB. The real time processor can be used to estimate such quality.

7.1.4 ([redacted]) For the tests of foreign broadcasts aimed at England as targets, the broadcast frequencies and estimated location data is required.

7.2 Radar Setup Procedures

7.2.1 Equipment Configuration

([redacted])(1) Radar transmitter chain including antenna
(2) Radar receiver chain (I, Q and beam-splitting channels are required)
(3) Signal Processor (however doppler-time and acceleration processors are not required)
(4) Data Processor and Display Formatter (PDP-9)
(5) Radar Control Console (RCC) including displays
(6) Raw receiver data recorder
(7) System Monitor Control
(8) Simulated Target Generator
(9) Vertical Sounder
(10) Look-through Receiver

7.2.2 Program Selection

([redacted]) Vertical sounding, oblique sounding, and manual modes will be used as described in Section 7.3.2.

[redacted]

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7.2.3 Initial Adjustments and Constants

7.2.3.1 ([redacted]) Radar Parameters (Vertical Sounder Mode)

a. PRF = 100 (Switch - Vertical Sounder Cabinet (VSC))
b. PPC = 8 (Switch - VSC)

7.2.3.2 ([redacted]) Radar Parameters (Oblique Sounder Mode)

a. Polarization = Both (Switch - Radar Control Console (RCC))
b. Minimum Frequency = 6 MHz (Numeric Selector - RCC)
c. Maximum Frequency = 40 MHz (Numeric Selector - RCC)
d. Range Switch = 4,000 nmi (Switch - RCC)

7.2.3.3 Radar Parameters (Manual Mode)

([redacted] In gathering the data it will be essential to operate the radar in a nonstandard fashion. Specifically it is necessary to preserve the clutter return, maintain a good range resolution, and minimize range ambiguities. For example, a 250-μs pulse, a 4-kHz sample rate, 20 pulses per second and a final bipolar video offset of 5 Hz.

Beam Position and polarization	Scheduled to cover one half the available azimuth one day and the other half the next, both horizontal and vertical polarization.
Frequency	Several frequencies selected to provide a good energy density out to maximum one hop refraction distance. Estimate four required.
Pulse length	250 μs (Narrow)
PRF	Nominally 20 PRF, although 40 PRF should be used in the day-time if range foldover does not occur.
Peak Power	Maximum
Integration Time	20 seconds
Simulated target	Commensurate with clutter level

Pulse shape	Cos^2
Velocity BW Ratio	2/T
D/T BW Ratio	Not required
Minimum Range Blanking	150 nmi

7.2.4 Radar Modification

([redacted]) Operation with a receiver frequency offset of 5 Hertz is required.

7.3 Radar Operating Procedures

7.3.1 Count-Down Check List

([redacted]) (1) Bring radar to standby mode. (Pushbutton - RCC)

(2) Check equipment status lights on RCC for "go" indication.

Displays
Data Processor
Signal Processor
RCVR
Radar Control
Exciter
RF Hardware
XTMR Subunits 1, 2, 3, 4, 5, and 6

(3) Check Exciter, Transmitter, Receiver and Signal Processor Waveforms on Systems Monitor Display.

(4) Check all digital readouts on RCC 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 by performing the Lamp Test (Switch - RCC).

(5) Verify manual input parameters presently existing in computer and check for discrepancies (Pushbutton - RCC)

(6) Set up transmitter frequency offset.

(7) If operation is against foreign broadcast stations, tune receiver manually.

7.3.2 Time Sequence of Operation

([redacted]) The complete procedure will consist of:

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(1) Making a vertical sounding of the ionosphere,
(2) Making an oblique sounding of the ionosphere at the selected azimuth positions,
(3) Collecting 2-minute data samples for each of 7 azimuths, both vertical and horizontal polarization and each of four frequencies. A complete sample will take about 2 hours.

7.3.3 Preliminary Data Evaluation

([redacted]) The radar displays will be used to check signal-to-noise ratio. Clutter-to-noise ratio should be at least 40 dB.

7.3.4 Data Recording

7.3.4.1 ([redacted]) Receiver output recordings should be made as specified in 7.3.2 twice daily for four days in each season. Each day should have a day sample taken between 0800 and 1100Z and a night sample taken between 2000 and 2300Z. On one day for each season fill in the rest of the day with similar data taken on headings of 030° and 100°. This will add about 80 hours of data.

7.3.4.2 ([redacted]) Additional time is required for exploring capabilities for using manmade targets as reference marks, 30 hours is estimated. The approach for cooperative targets will depend upon their characteristics and hopefully this data will be automatically collected with that of 2.1. In addition it appears that high-gain antenna systems with their transmitters active should provide discernible targets and this should be explored. (Ref. 2)

7.3.4.3 ([redacted]) A photograph will be taken of the vertical sounding display and of the oblique sounding display for both antenna polarizations in accordance with 7.3.2.

7.3.4.4 ([redacted]) The data recording time estimate is 172 hours.

7.4 Support Setup Procedures

([redacted]) There are no support setup procedures.

7.5 Support Operating Procedures

([redacted]) There are no support operating procedures.

7.6 Liaison and Communication Procedures

7.6.1 ([redacted]) Real time data is required on foreign broadcasts.

7.6.2 ([redacted]) After-the-fact collection of ionosphere soundings is required from AF weather service.

[redacted]

REFERENCES

1. "Virtual Path Tracing for HF Radar Including an Ionospheric Model," NRL Memo Report 2226 (Uncl title & Report), J. M. Headrick, J. F. Thomason, D. L. Lucas, S. R. McCammon, R. A. Hanson and J. L. Lloyd, March 1971.

2. "Project Hopscotch," ([redacted]) SRI Secret Technical Report 3, O. G. Villard and V. R. Frank, December 1970.

3. "Determination of the Structure of the Remote Ionosphere from Backscatter Observations," D. L. Lucas, S. R. McCamman, J. M. Headrick and J. M. Hudnall, NRL unclassified Memo Report in preparation.

4. "Doppler Spectrum of Sea Echo at 13.56 Mc/s," D. D. Crombie, Nature 175, pp. 681-682, 1955.

[redacted]

[redacted]

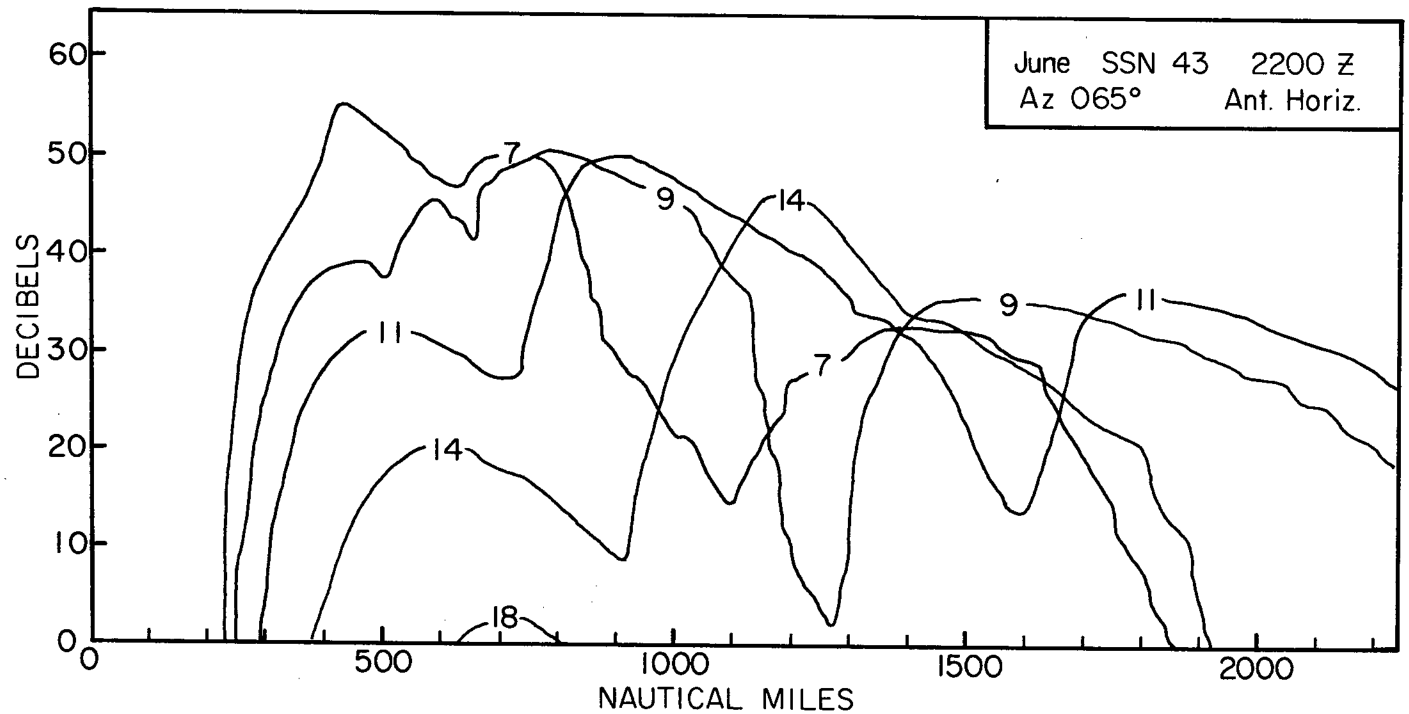

Fig. 1 - Predicted backscatter level versus range using horizontal polarization. This set, parametric in frequency, has been derived from the Appendix. (U)

[redacted]

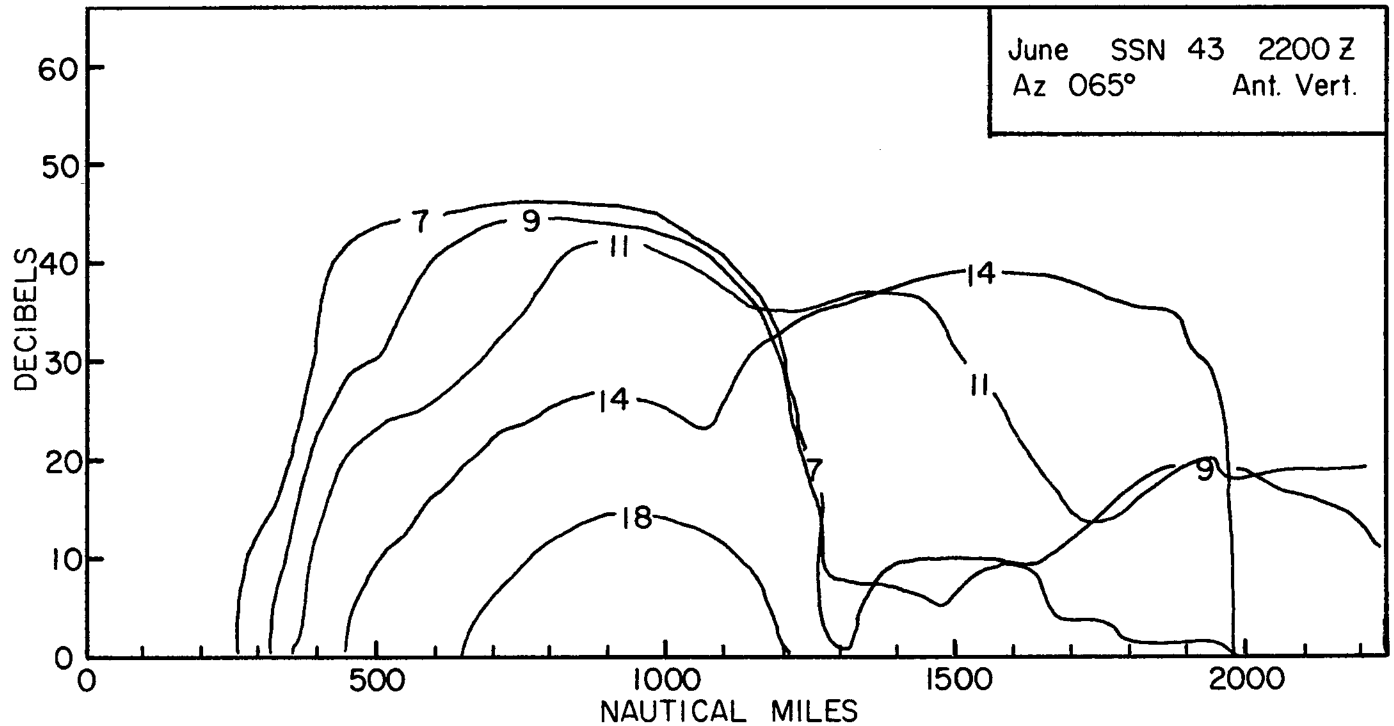

Fig. 2 - Predicted backscatter level versus range using vertical polarization. This set, parametric in frequency, has been derived from the Appendix. (U)

[redacted]

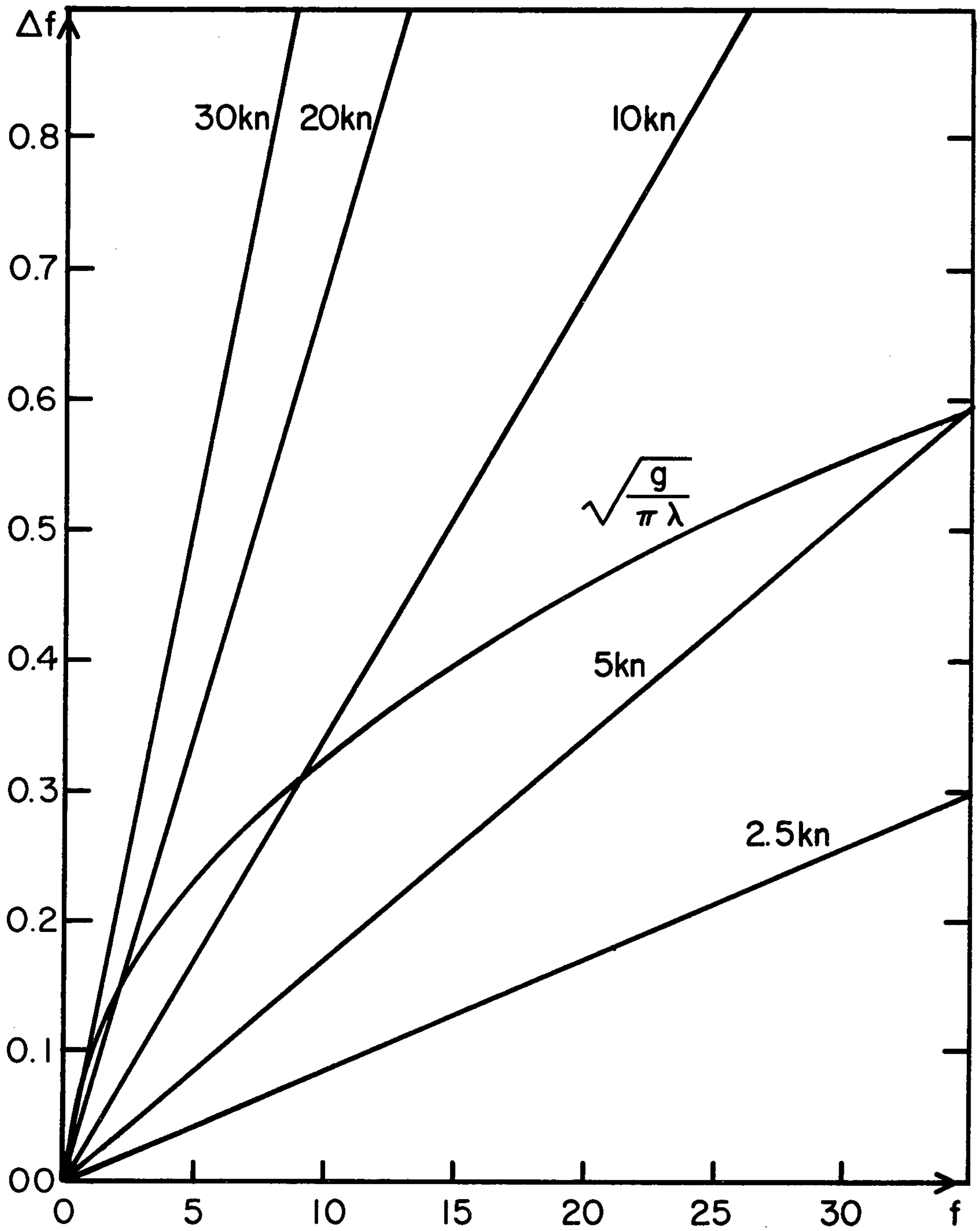

Fig. 3 – The doppler displacement, Hertz, versus operating frequency in megahertz for several target speeds and for the sea return ($\sqrt{\frac{g}{\pi\lambda}}$). The sea returns can be expected to have both an approach and recede component possessing the displacement. ([redacted])

 [redacted]

[redacted]

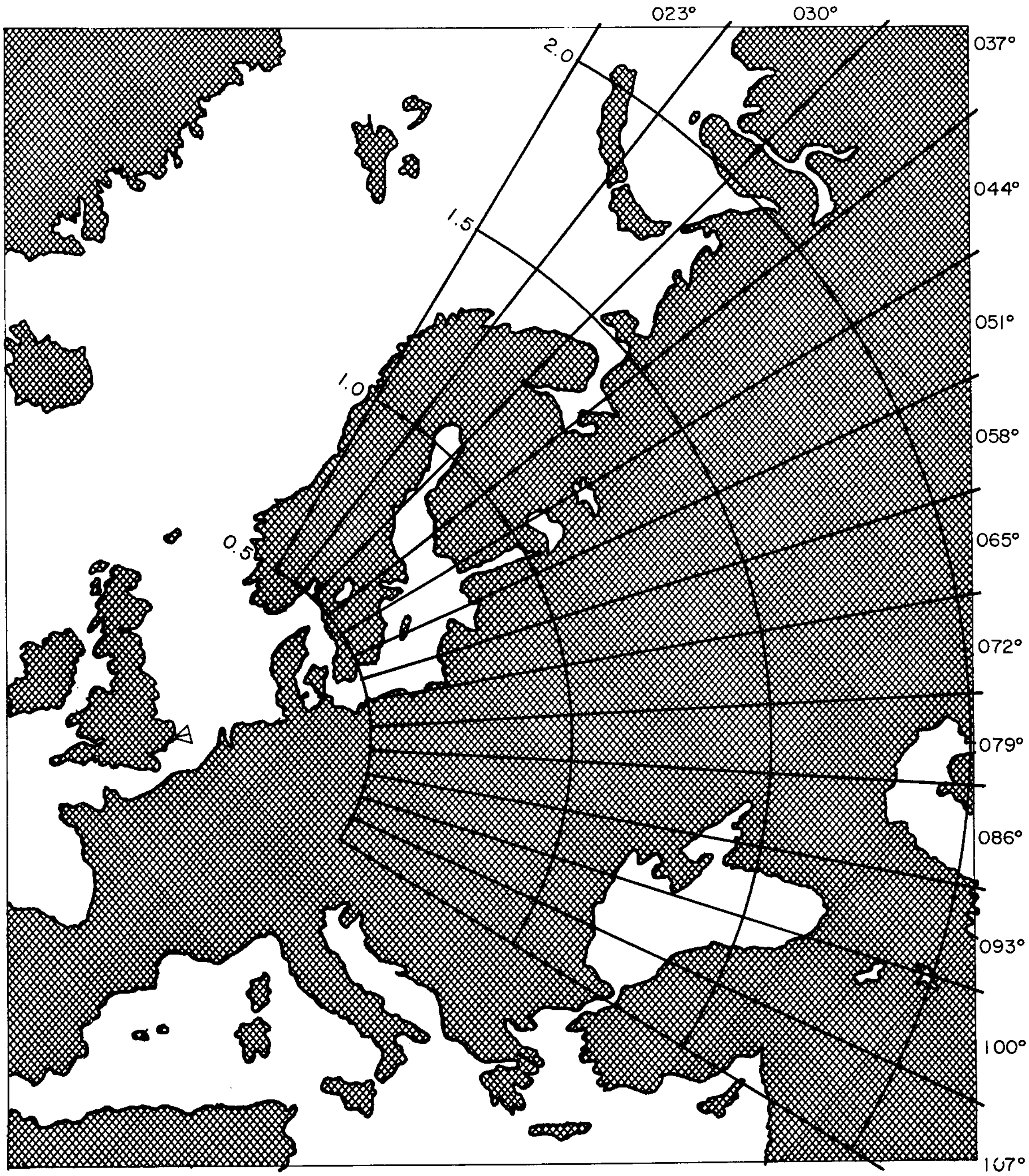

Fig. 4 - The primary coverage chart. Note that range marks can be provided by the near and far edges of the Black Sea, the near edge of the Caspian Sea, the far finger edges of the Baltic Sea, the far edge of Scandinavia, and the near edge of Novya Zemlya. Azimuthal determinations on a beamwidth basis have numerous availabilities and monopulse possibilities exist. ([redacted])

 [redacted]

[redacted]

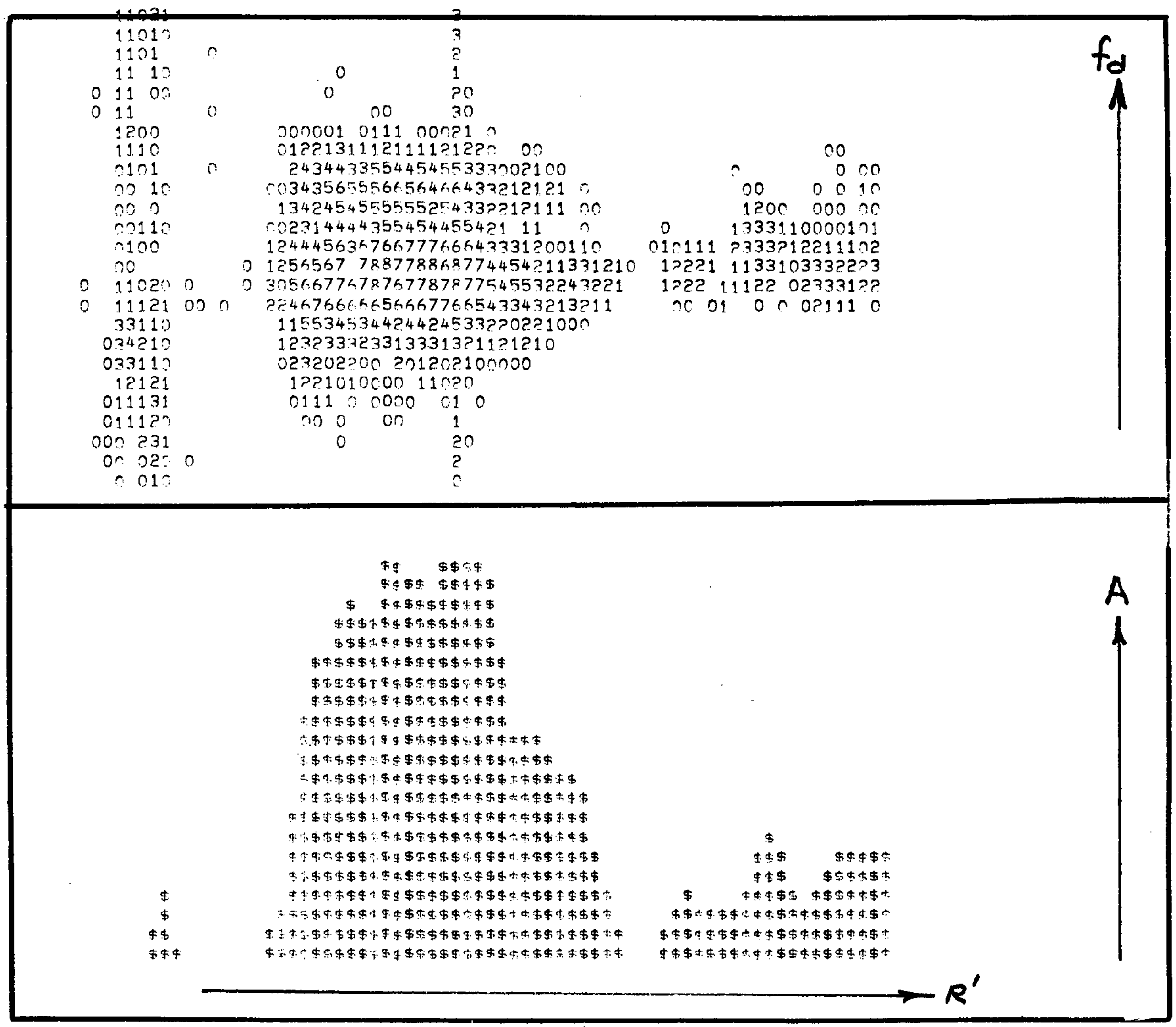

Fig. 5 - Example of backscatter versus virtual range computer printout. At the top is a three-dimensional display with the number corresponding to level (6dB per number). The lower display gives averaged amplitude versus virtual range. ([redacted])

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[redacted]

[redacted]

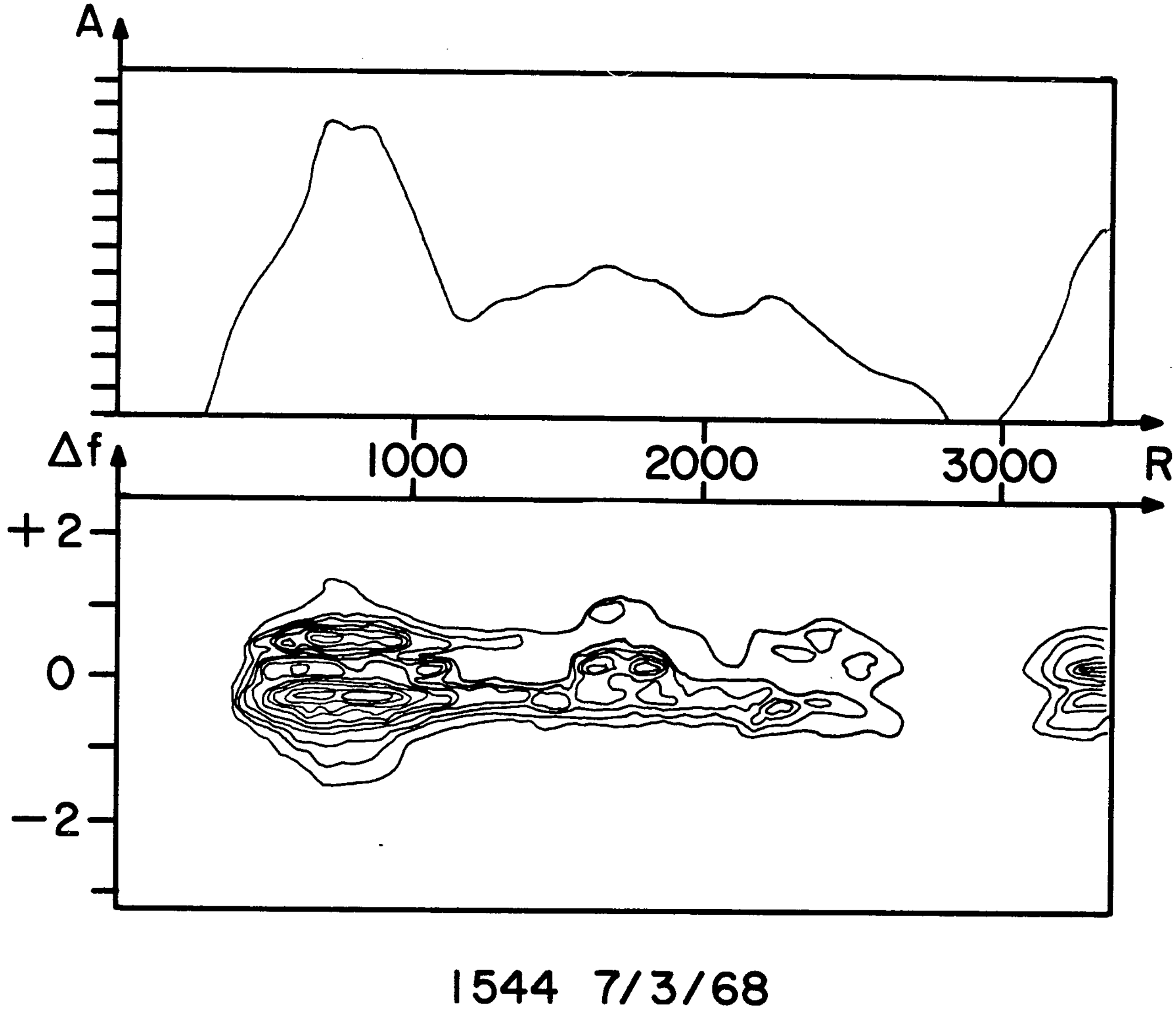

Fig. 6 - Line drawing example of backscatter versus virtual range. Amplitude steps and contours are at 6-dB intervals. ([redacted])

[redacted]

[redacted]

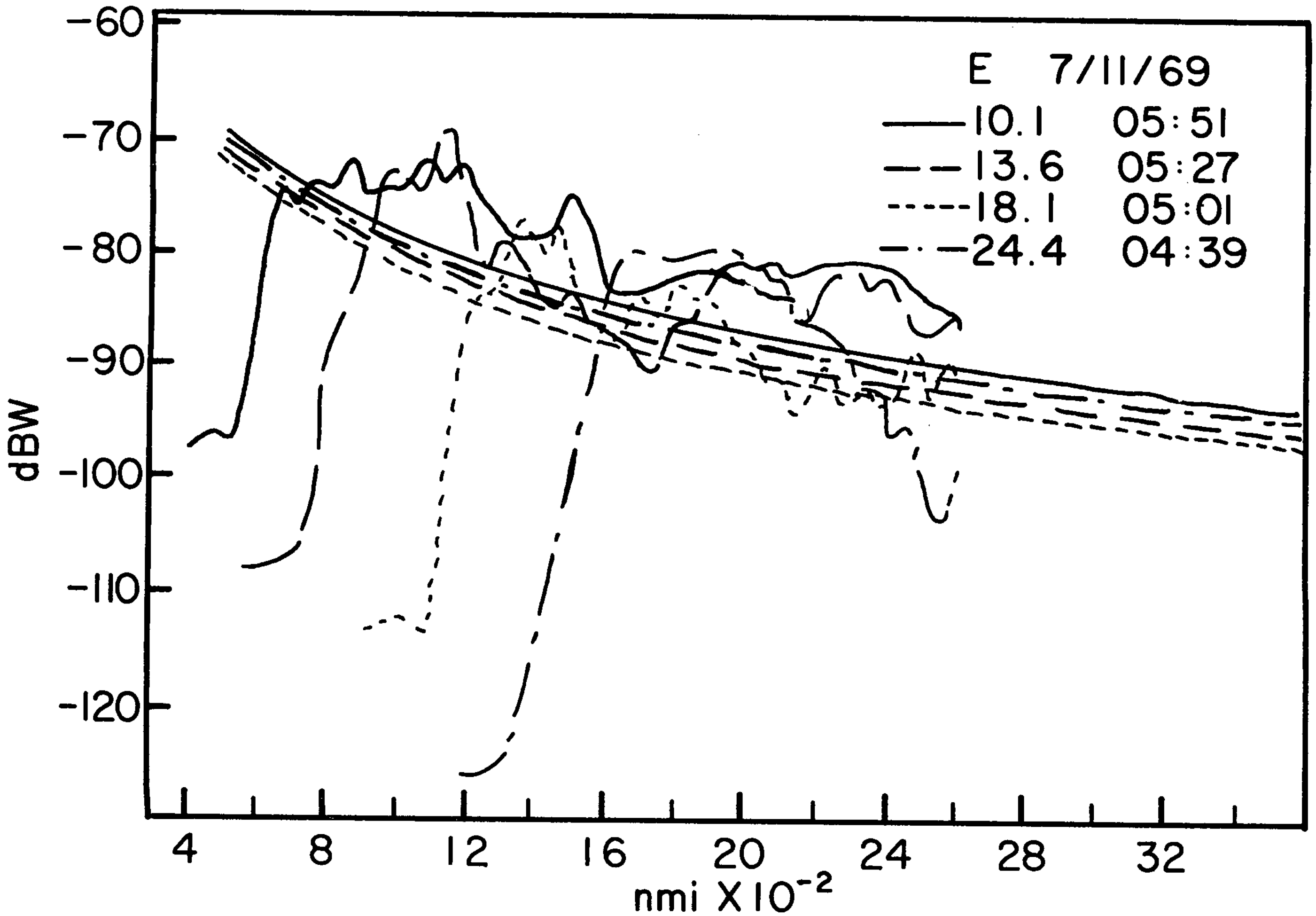

Fig. 7 - A nighttime example of backscatter amplitude versus virtual range for four frequencies. In addition the levels for $\sigma^o = -20$, maximum antenna gain and no absorption level have been plotted. The antenna for this example had a multiscalloped pattern. It appears that the estimate of $\sigma^o = -20$ dB is small by a few dB. ([redacted])

[redacted]

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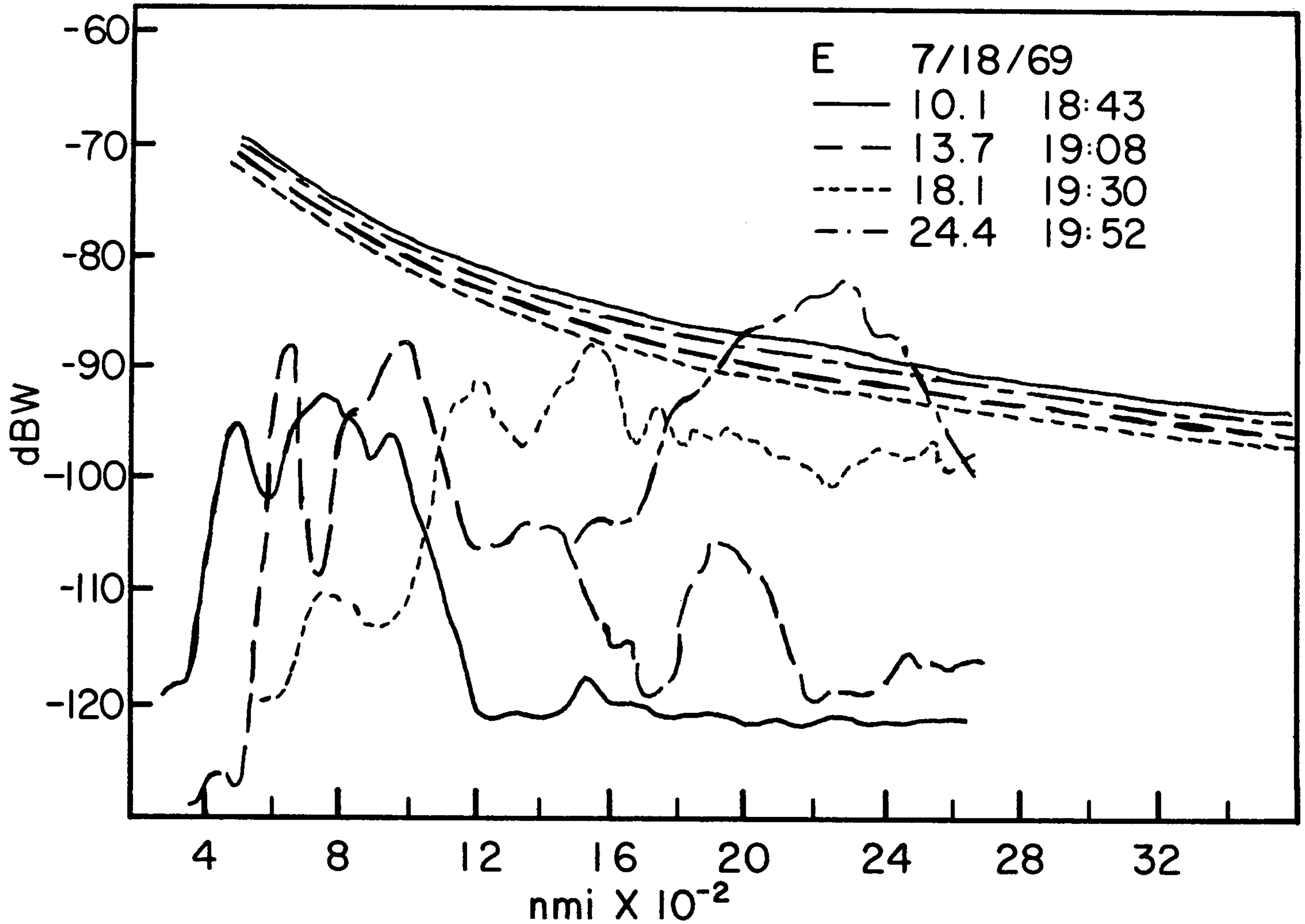

Fig. 8 – A daytime example of backscatter amplitude versus virtual range plotted as for Fig. 7. Loss estimates can be made using σ^0 determined from night observations and path analysis. ([redacted])

[redacted]

[redacted]

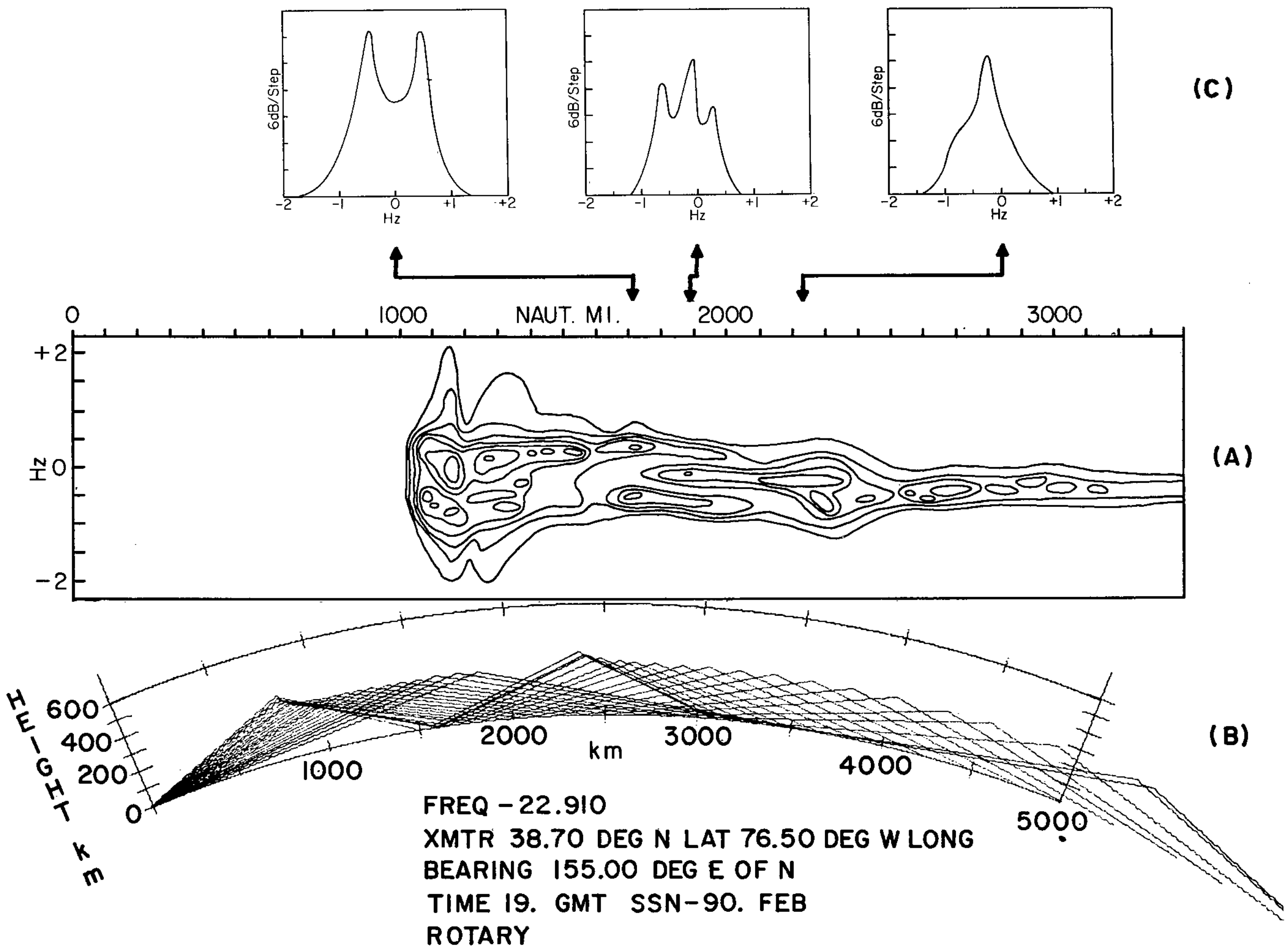

Fig. 9 - (A) The center plot is an example of backscatter amplitude and doppler versus virtual range. (B) The lower plot gives an estimate of virtual paths where the range dimension nominally coincides with that of (A). (C) At the top are doppler cuts with the first of the sea returns, the second of both land and sea and the third of just land. Note that more doppler spreading occurs with the higher angle rays for both the first and second hop. ([redacted])

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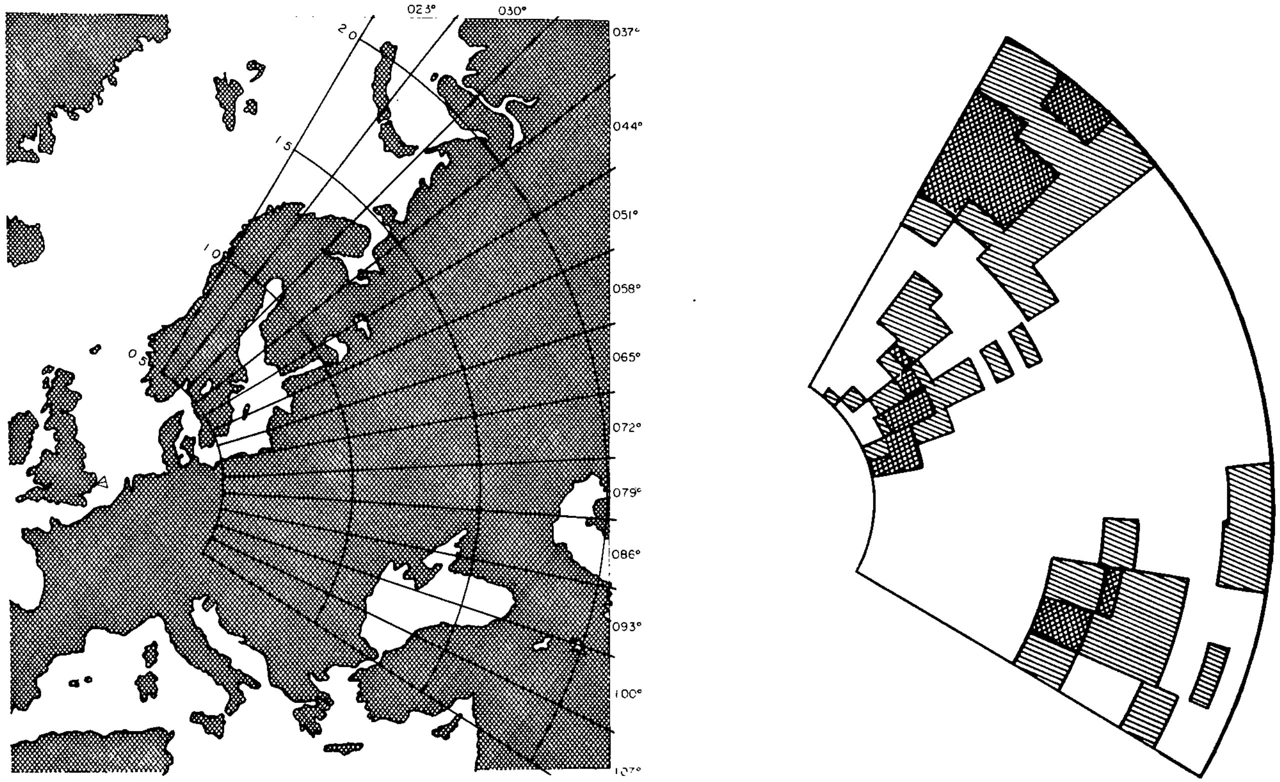
[redacted]



(A) (B)

Fig. 10 - (A) The primary coverage. (B) Range azimuth cells that have exclusive land doppler, land and sea doppler, and sea doppler. ([redacted])

 [redacted]

[redacted]

APPENDIX

SAMPLE BACKSCATTER AND PROPAGATION GEOMETRY PREDICTIONS

1.0 ([redacted]) The computer printout shown on the following pages was prepared for the AN/FPS-95 radar by the NRL OTH ionospheric model, RADAR5. There are six lead pages of output for each time (GMT) considered, i.e., 1.1 below. For a given time, each entry in the frequency table will generate between 4 and 14 pages of additional output, i.e., 1.2 below. The individual pages of output are as follows:

1.1 ([redacted]) <u>For Each Time</u>

Pages 1 and 2 of the printout are ionogram tables of the four sample areas. Each table is composed of 206 data points. In each table the first 200 points represent virtual heights every 0.1 MHz beginning at 0.1 MHz. The remaining 6 points are:

201 - virtual height at the x point for the E-layer
202 - virtual height at the x point for the F1-layer
203 - virtual height at the x point for the F2-layer
204 - virtual height at the cusp for the E-layer
205 - virtual height at the cusp for the F1-layer
206 - virtual height at the cusp for the F2-layer

1.1.1 ([redacted]) Pages 4 and 6 of the printout graph the ionogram tables described above. The virtual height from 100 km to 700 km is given as a function of vertical sounding frequency from .1 to 12 MHz. Two curves are shown for each reflection area. The height increment is 12.5 km. The frequency increment is .1 MHz.

1.1.2 ([redacted]) Pages 3 and 5 show the indices necessary to generate the ionograms at the sample areas. Four critical frequencies are given, one for each layer. The heights of maximum ionization and semithicknesses are given for the E-, F1-, and F2-layers. The frequencies are in megahertz and the heights and semithicknesses are in kilometers. The factors shown indicate the amount by which the critical frequencies for the indicated layer vary from the monthly medians for those layers. E_s lower, median and upper decile values shown refer to the distribution of sporadic-E critical frequencies.

1.2 ([redacted]) <u>For Each Frequency</u>

1.2.1 <u>Ionospheric Layer Data</u>

([redacted]) Pages 7 through 10 show the data generated for sets of rays for one- and two-hop modes. The columns are described as follows:

[redacted]

TIME	Delay time, milliseconds
DEL1	Vertical takeoff angle at transmitter, degrees
DEL2	Vertical angle at scattering area, degrees
TILT	Ionospheric tilt, degrees
HITE	Virtual height of reflection, kilometers
GCDNM	Great Circle distance, nautical miles
ABS	Reflection loss or ionospheric absorption, decibels
FREE	Free-space loss between isotropic antennas, decibels
ANT	Power gain of antenna, decibels above free-space isotropic antenna
BEAM	Horizontal beamwidth of antenna at half-power points, degrees
AREA	Backscatter area, in square kilometers
BACK	Effective backscatter gain, decibels above an isotropic antenna in free space
OBF	The E_s obscuration factor, decibels
LOSS	Two-way system loss, decibels
IMP	Impedance of the receivers, decibels
PWR	Peak transmitted power, decibels above 1 watt
VOLT	Received amplitude, volts
DBW	Average received power decibels relative to 1 watt
RANGE	Slant range - nautical miles

1.2.2 Backscatter Amplitude

([redacted]) Page 11 shows normalized backscatter signal-to-noise level as a function of time delay. The backscatter amplitude is from 0 to 60 dB and S/N in increments of 2.5 dB. The time delay is from 0 to 28 milliseconds in increments of .25 milliseconds. The table at the bottom of the page shows the values at the skip distance and at the maximum distance.

1.2.3 Radiation Angle Plot

([redacted]) The radiation angles associated with the backscatter plot are plotted using the same scale for time delay.

1.2.4 ([redacted]) The remaining pages of printout in this Appendix show the information described in 1.2.1, 1.2.2, and 1.2.3 above for other frequencies and antenna polarizations.

[redacted]

REFLECTION AREA 1, TRAJECTORY 1, 1299 KILOMETERS DOWN RANGE

110.254	111.222	112.773	115.146	118.540	123.466	131.308	150.997
271.172	260.172	255.751	253.475	252.233	251.590	251.337	251.261
251.594	251.995	252.535	253.200	253.973	254.346	255.815	256.376
258.024	259.264	260.591	262.207	263.514	265.115	264.813	268.612
270.516	272.591	274.664	276.921	279.312	281.947	284.538	287.399
290.44[illegible]	293.724	297.191	300.941	304.990	309.385	314.169	319.480
325.372	332.622	339.667	348.483	358.733	374.154	395.414	440.019
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
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.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
132.035	.000	333.193	110.000	170.000	.000		

REFLECTION AREA 1, TRAJECTORY 2, 1499 KILOMETERS DOWN RANGE

110.394	111.212	112.301	115.190	118.620	123.607	131.597	152.433
271.224	260.657	256.357	254.144	252.943	252.332	252.108	252.159
252.419	252.946	253.415	254.106	254.908	255.813	256.814	257.909
259.094	260.373	261.740	263.201	264.755	266.406	268.157	270.013
271.970	274.060	276.264	278.600	281.075	283.703	286.495	289.469
293.642	296.077	299.681	303.609	307.864	312.499	317.588	323.226
329.542	336.755	345.148	355.243	368.002	385.622	415.427	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
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.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
130.035	.000	339.248	110.000	170.000	.000		

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REFLECTI[illegible] AREA 2, I[illegible]GRAM 1, 2699 KILOMETERS DOWN RANGE

110.262	111.062	112.449	114.511	117.419	121.508	127.560	138.356
252.621	267.202	262.513	257.413	255.810	255.017	254.729	254.793
255.112	255.651	256.357	257.215	258.209	259.329	260.569	261.926
262.357	264.982	266.683	268.503	270.444	272.512	274.712	277.052
279.542	282.186	285.003	288.004	291.207	294.631	298.302	302.250
306.511	311.134	316.177	321.721	327.871	334.778	342.660	351.858
362.944	377.007	396.558	430.277	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
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.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
137.036	.000	347.636	110.000	170.000	.000		

REFLECTI[illegible] AREA 2, I[illegible]GRAM 2, [illegible] KILOMETERS DOWN RANGE

110.251	111.016	112.337	114.297	117.048	120.878	126.434	135.749
323.73[illegible]	270.375	262.273	258.710	256.887	255.974	255.619	255.643
255.94[illegible]	256.476	257.136	258.055	259.067	260.211	261.480	262.870
264.372	266.007	267.755	269.627	271.625	273.755	276.023	278.437
281.006	283.741	284.655	289.763	293.085	296.641	300.460	304.574
307.024	313.268	312.167	325.016	331.539	338.913	347.405	357.443
360.782	335.269	412.095	463.305	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000
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F1 CRITICAL =      .000
F2 CRITICAL =     5.647
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F1 HMAX =      .000
F2 HMAX =  314.113
E  SEMITHICKNESS =   20.000
F1 SEMITHICKNESS =     .000
F2 SEMITHICKNESS =   73.014

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ES CRITICAL =     2.335
E  CRITICAL =      .821
F1 CRITICAL =      .000
F2 CRITICAL =     5.590
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F1 HMAX =      .000
F2 HMAX =  315.071
E  SEMITHICKNESS =   20.000
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F2 SEMITHICKNESS =   73.282
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VIRTUAL HEIGHT VS VERTICAL FREQUENCY
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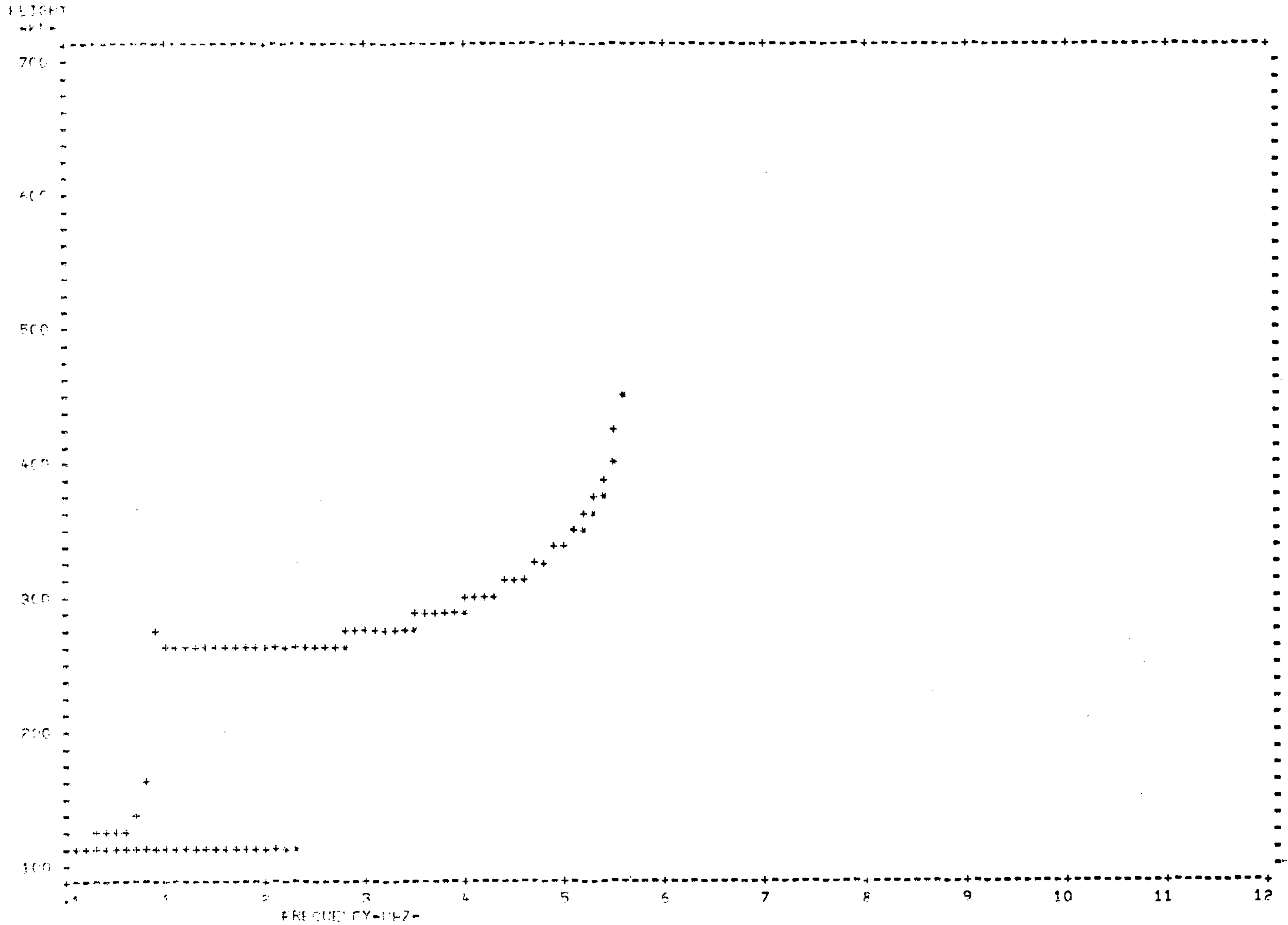

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     E FACTOR = 1.00     F1 FACTOR = 1.00     F2 FACTOR = 1.00     ES FACTOR = 1.00
     ES---LOWER DECILE=        4.538  MEDIAN=        2.111  UPPER=        -.188

*****************************************

ES CRITICAL =     2.111
E  CRITICAL =      .375
F1 CRITICAL =      .000
F2 CRITICAL =     5.235
E  HMAX =  130.000
F1 HMAX =       .000
F2 HMAX =  321.476
E  SEMITHICKNESS =   20.000
F1 SEMITHICKNESS =     .000
F2 SEMITHICKNESS =   79.074

++++++++++++++++++++++++++++++

ES CRITICAL =     2.111
E  CRITICAL =      .395
F1 CRITICAL =      .000
F2 CRITICAL =     5.240
E  HMAX =  130.000
F1 HMAX =       .000
F2 HMAX =  322.423
E  SEMITHICKNESS =   20.000
F1 SEMITHICKNESS =     .000
F2 SEMITHICKNESS =   79.715
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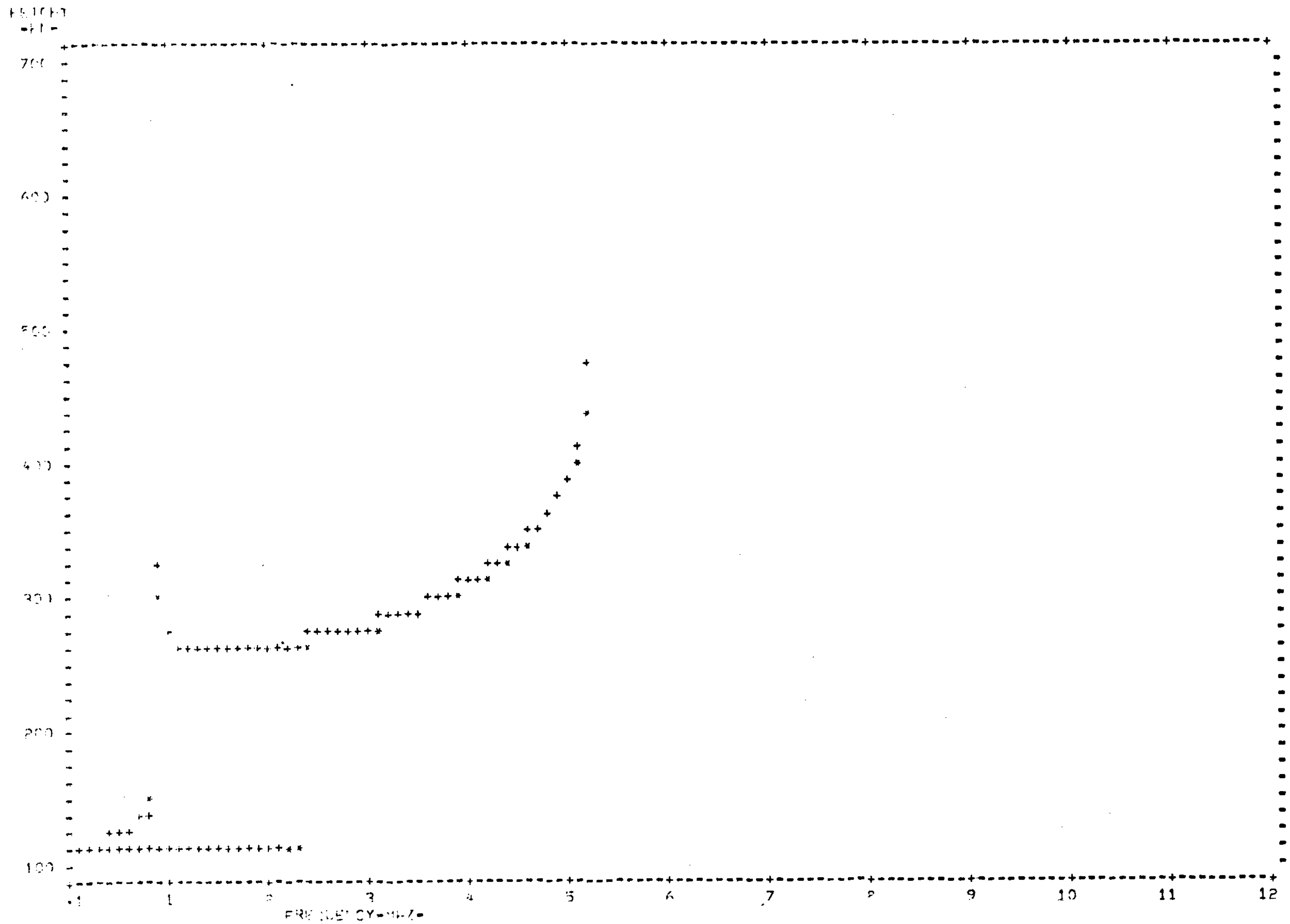
VIRTUAL HEIGHT VS VERTICAL FREQUENCY
JUL SSN 43 REFLECTION AREA 2
BEARING 65 DEG 22 GMT



[redacted]

S[redacted]

JU [illegible] [illegible] 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 7.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
23.9	.0	.3	.1	252.	1874.	10.3	240.8	25.0	7.0	7698.	64.2	48.4	210.	17.0	69.9	.001	-140.	1923.
22.9	2.5	.3	.1	252.	1747.	10.2	239.6	49.0	7.0	7288.	63.9	48.4	185.	17.0	69.9	.012	-115.	1797.
18.9	5.0	4.1	.1	252.	1435.	9.4	236.3	48.8	7.0	6067.	63.2	48.4	182.	17.0	69.9	.017	-112.	1485.
15.9	7.5	5.8	.1	253.	1229.	8.4	233.7	46.0	7.0	5257.	62.5	48.4	182.	17.0	69.9	.017	-112.	1281.
13.7	10.0	8.6	.1	254.	1059.	7.4	231.3	40.6	7.0	4600.	61.9	48.4	185.	17.0	69.9	.013	-115.	1113.
12.1	12.5	12.3	.0	255.	924.	6.6	229.1	39.8	7.0	4091.	61.4	48.4	183.	17.0	69.9	.016	-113.	981.
10.9	15.0	14.7	.1	256.	822.	5.9	227.2	34.6	7.0	3718.	61.0	25.0	162.	17.0	69.9	.166	-93.	883.
9.9	17.5	17.1	.1	259.	738.	5.3	225.6	29.0	7.0	3421.	60.7	9.7	151.	17.0	69.9	.628	-81.	803.
9.1	20.0	19.6	.2	261.	666.	4.8	224.1	21.0	7.0	3180.	60.3	9.0	157.	17.0	69.9	.330	-87.	735.
8.4	22.5	22.0	.2	264.	606.	4.4	222.7	19.0	7.0	2991.	60.1	8.3	156.	17.0	69.9	.336	-86.	681.
7.8	24.9	24.7	.1	267.	551.	4.0	221.5	16.0	7.0	2837.	59.9	7.7	157.	17.0	69.9	.300	-87.	632.
7.4	27.4	27.1	.1	271.	509.	3.7	220.4	13.8	7.0	2729.	59.7	7.2	158.	17.0	69.9	.283	-88.	596.
7.0	29.9	29.5	.2	275.	472.	3.5	219.5	4.0	7.0	2651.	59.6	6.7	166.	17.0	69.9	.108	-96.	566.
6.7	32.4	31.8	.3	280.	440.	3.3	218.8	-10.0	7.0	2598.	59.5	6.3	179.	17.0	69.9	.025	-109.	542.
6.4	34.9	34.0	.2	286.	410.	3.1	218.1	-10.0	7.0	2567.	59.4	6.0	178.	17.0	69.9	.029	-108.	520.
6.2	37.4	36.7	.3	292.	384.	2.9	217.5	-10.0	7.0	2561.	59.4	5.7	177.	17.0	69.9	.033	-107.	504.
6.1	39.9	38.6	.6	298.	364.	2.8	217.1	-10.0	7.0	2565.	59.4	5.4	176.	17.0	69.9	.036	-106.	492.
6.0	42.4	40.7	.8	305.	345.	2.7	216.8	-10.0	7.0	2597.	59.5	5.2	175.	17.0	69.9	.039	-105.	483.
5.9	44.9	42.8	1.0	313.	328.	2.6	216.5	-10.0	7.0	2646.	59.5	5.0	175.	17.0	69.9	.041	-105.	477.
5.8	47.4	45.4	.9	323.	310.	2.5	216.4	-10.0	7.0	2736.	59.7	4.8	174.	17.0	69.9	.044	-104.	472.
5.8	49.9	48.2	.8	336.	294.	2.4	216.4	-10.0	7.0	2888.	59.9	4.7	174.	17.0	69.9	.047	-104.	472.
5.8	50.9	49.2	.8	336.	284.	2.3	216.2	-10.0	7.0	2906.	60.0	4.7	173.	17.0	69.9	.033	-107.	466.
5.7	51.9	50.2	.8	336.	275.	2.3	215.9	-10.0	7.0	2927.	60.0	4.6	173.	17.0	69.9	.032	-107.	460.
5.6	52.9	51.2	.8	336.	265.	2.3	215.7	-10.0	7.0	2952.	60.0	4.6	173.	17.0	69.9	.030	-107.	454.
5.5	53.9	52.2	.8	336.	256.	2.2	215.5	-10.0	7.0	2982.	60.1	4.5	172.	17.0	69.9	.029	-108.	448.
5.5	54.9	53.2	.8	336.	247.	2.2	215.3	-10.0	7.0	3015.	60.1	4.5	172.	17.0	69.9	.027	-108.	443.
5.4	55.9	54.2	.8	336.	238.	2.2	215.1	-10.0	7.0	3052.	60.2	4.5	172.	17.0	69.9	.026	-109.	438.
5.4	56.9	55.2	.8	336.	230.	2.2	214.9	-10.0	7.0	3094.	60.2	4.4	171.	17.0	69.9	.024	-109.	433.
5.3	57.9	56.2	.8	336.	221.	2.1	214.7	-10.0	7.0	3140.	60.3	4.4	171.	17.0	69.9	.023	-110.	429.
5.2	58.9	57.2	.8	336.	213.	2.1	214.5	-10.0	7.0	3192.	60.4	4.4	171.	17.0	69.9	.021	-110.	424.
5.2	59.9	58.2	.8	336.	205.	2.1	214.3	-10.0	7.0	3249.	60.4	4.4	170.	17.0	69.9	.020	-111.	420.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
37.5	4.1	3.9	.1	256.	2930.	9.5	12.7	.0	7.0	12385.	66.3	9.3	211.	17.0	69.9	.001	-141.	3032.
32.3	6.8	6.4	.1	257.	2509.	8.5	12.6	.0	7.0	10719.	65.6	8.6	209.	17.0	69.9	.001	-139.	2614.
27.9	9.6	9.3	.1	258.	2150.	7.5	12.6	.0	7.0	9328.	65.0	7.7	209.	17.0	69.9	.001	-139.	2259.
24.5	12.3	12.1	.2	259.	1870.	6.5	12.5	.0	7.0	8273.	64.5	6.7	205.	17.0	69.9	.001	-136.	1985.
22.1	14.7	14.5	.1	261.	1665.	5.9	12.5	.0	7.0	7522.	64.1	5.8	184.	17.0	69.9	.015	-114.	1787.
20.1	17.1	16.8	.1	264.	1499.	5.3	12.6	.0	7.0	6939.	63.7	5.1	171.	17.0	69.9	.064	-101.	1630.
18.4	19.5	19.5	.0	267.	1351.	4.8	12.5	.0	7.0	6446.	63.4	4.3	175.	17.0	69.9	.039	-105.	1491.
17.1	22.0	21.7	.3	270.	1233.	4.4	12.6	.0	7.0	6071.	63.2	3.6	174.	17.0	69.9	.045	-104.	1384.
15.9	24.7	24.5	.2	275.	1123.	4.0	12.6	.0	7.0	5764.	62.9	3.0	174.	17.0	69.9	.045	-104.	1287.
15.0	27.1	27.0	.1	280.	1037.	3.7	12.6	.0	7.0	5554.	62.8	2.5	174.	17.0	69.9	.046	-104.	1214.
14.3	29.5	29.0	.4	285.	968.	3.5	12.7	.0	7.0	5397.	62.6	2.1	181.	17.0	69.9	.019	-111.	1159.
13.7	31.8	31.3	.4	291.	905.	3.3	12.8	.0	7.0	5304.	62.6	1.7	194.	17.0	69.9	.005	-124.	1112.
13.2	34.3	34.3	.1	298.	842.	3.1	12.7	.0	7.0	5261.	62.5	1.4	192.	17.0	69.9	.006	-122.	1067.
12.8	36.7	35.9	.7	305.	796.	2.9	12.8	.0	7.0	5226.	62.5	1.1	190.	17.0	69.9	.007	-121.	1038.
12.6	38.6	38.2	.4	313.	756.	2.8	12.9	.0	7.0	5270.	62.5	1.0	189.	17.0	69.9	.008	-119.	1017.
12.4	40.7	39.6	1.0	320.	724.	2.7	12.9	.0	7.0	5305.	62.6	.8	189.	17.0	69.9	.008	-119.	1003.
12.2	42.8	42.2	.5	330.	687.	2.6	12.9	.0	7.0	5443.	62.7	.7	188.	17.0	69.9	.009	-118.	989.
12.2	45.4	43.8	1.4	344.	659.	2.5	13.1	.0	7.0	5576.	62.8	.5	190.	17.0	69.9	.007	-120.	987.
11.9	48.2	46.6	1.4	344.	612.	2.4	12.7	.0	7.0	5736.	62.9	.4	191.	17.0	69.9	.006	-121.	966.
11.8	49.2	47.7	1.4	344.	591.	2.4	12.7	.0	7.0	5764.	62.9	.4	195.	17.0	69.9	.004	-125.	953.
11.6	50.2	48.7	1.4	344.	571.	2.3	12.7	.0	7.0	5798.	63.0	.3	197.	17.0	69.9	.003	-127.	940.
11.5	51.2	49.7	1.4	344.	552.	2.3	12.7	.0	7.0	5840.	63.0	.3	198.	17.0	69.9	.003	-128.	928.
11.3	52.2	50.7	1.4	344.	533.	2.3	12.7	.0	7.0	5889.	63.0	.3	199.	17.0	69.9	.002	-129.	916.
11.2	53.2	51.7	1.4	344.	514.	2.2	12.7	.0	7.0	5945.	63.1	.3	201.	17.0	69.9	.002	-131.	905.
11.0	54.2	52.7	1.4	344.	496.	2.2	12.6	.0	7.0	6009.	63.1	.2	202.	17.0	69.9	.002	-132.	894.
10.9	55.2	53.7	1.4	344.	478.	2.2	12.6	.0	7.0	6082.	63.2	.2	204.	17.0	69.9	.001	-134.	884.
10.8	56.2	54.7	1.4	344.	461.	2.1	12.6	.0	7.0	6163.	63.2	.2	206.	17.0	69.9	.001	-136.	874.
10.7	57.2	55.7	1.4	344.	444.	2.1	12.6	.0	7.0	6253.	63.3	.2	207.	17.0	69.9	.001	-137.	865.
10.6	58.2	56.7	1.4	344.	428.	2.1	12.6	.0	7.0	6354.	63.4	.2	209.	17.0	69.9	.001	-139.	856.

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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 7.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.0	.0	.0	.0	110.	1269.	17.9	233.7	25.0	7.0	5232.	62.5	.0	164.	17.0	69.9	.137	-94.	1284.
31.7	.0	.0	.0	110.	2539.	41.3	245.7	25.0	7.0	10464.	65.5	.0	203.	17.0	69.9	.002	-133.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	232.1	44.6	7.0	4766.	62.1	.0	143.	17.0	69.9	1.510	-73.	1169.
28.9	1.0	1.0	.0	110.	2310.	41.3	244.1	44.6	7.0	9533.	65.1	.0	183.	17.0	69.9	.010	-117.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	230.5	49.0	7.0	4347.	61.7	.0	138.	17.0	69.9	2.880	-68.	1066.
26.3	2.0	2.0	.0	110.	2103.	41.4	242.5	49.0	7.0	8694.	64.7	.0	177.	17.0	69.9	.018	-112.	2132.
12.0	3.0	3.0	.0	110.	959.	17.9	228.9	49.8	7.0	3972.	61.3	.0	136.	17.0	69.9	3.621	-66.	973.
24.1	3.0	3.0	.0	110.	1918.	41.6	240.9	49.8	7.0	7944.	64.3	.0	175.	17.0	69.9	.024	-109.	1947.
11.0	4.0	4.0	.0	110.	876.	17.9	227.4	49.4	7.0	3639.	60.9	.0	135.	17.0	69.9	3.952	-65.	891.
22.0	4.0	4.0	.0	110.	1752.	41.7	239.4	49.4	7.0	7278.	63.9	.0	175.	17.0	69.9	.027	-108.	1782.
10.1	5.0	5.0	.0	110.	802.	17.9	225.9	48.8	7.0	3344.	60.6	.0	134.	17.0	69.9	4.198	-65.	817.
20.2	5.0	5.0	.0	110.	1605.	42.0	237.9	48.8	7.0	6688.	63.6	.0	174.	17.0	69.9	.030	-107.	1635.
9.3	6.0	6.0	.0	110.	737.	17.9	224.5	47.6	7.0	3084.	60.2	.0	135.	17.0	69.9	4.143	-65.	753.
18.6	6.0	6.0	.0	110.	1474.	42.3	236.5	47.6	7.0	6167.	63.2	.0	175.	17.0	69.9	.030	-108.	1505.
8.6	7.0	7.0	.0	110.	679.	17.9	223.1	46.0	7.0	2854.	59.9	.0	135.	17.0	69.9	3.886	-65.	695.
17.2	7.0	7.0	.0	110.	1359.	42.6	235.1	46.0	7.0	5708.	62.9	.0	176.	17.0	69.9	.028	-108.	1390.
8.0	8.0	8.0	.0	110.	628.	17.9	221.8	43.6	7.0	2651.	59.6	.0	137.	17.0	69.9	3.307	-67.	644.
15.9	8.0	8.0	.0	110.	1256.	43.1	233.8	43.6	7.0	5302.	62.6	.0	177.	17.0	69.9	.023	-110.	1288.
7.4	9.0	9.0	.0	110.	583.	17.9	220.5	41.4	7.0	2472.	59.3	.0	138.	17.0	69.9	2.866	-68.	599.
14.8	9.0	9.0	.0	110.	1165.	43.5	232.5	41.4	7.0	4944.	62.3	.0	179.	17.0	69.9	.019	-111.	1198.
6.9	10.0	10.0	.0	110.	542.	17.9	219.3	40.6	7.0	2314.	59.0	.0	138.	17.0	69.9	2.903	-68.	559.
13.8	10.0	10.0	.0	110.	1084.	44.0	231.3	40.6	7.0	4628.	62.0	.0	180.	17.0	69.9	.019	-111.	1118.
6.5	11.0	11.0	.0	110.	506.	17.9	218.2	40.6	7.0	2174.	58.7	.0	137.	17.0	69.9	3.210	-67.	524.
12.9	11.0	11.0	.0	110.	1012.	44.6	230.2	40.6	7.0	4347.	61.7	.0	179.	17.0	69.9	.020	-111.	1047.
6.1	12.0	12.0	.0	110.	473.	17.9	217.1	39.8	7.0	2049.	58.4	.0	137.	17.0	69.9	3.221	-67.	492.
12.2	12.0	12.0	.0	110.	947.	45.3	229.1	39.8	7.0	4098.	61.4	.0	180.	17.0	69.9	.019	-112.	984.
5.7	13.0	13.0	.0	110.	444.	17.9	216.0	39.0	7.0	1938.	58.2	.0	137.	17.0	69.9	3.219	-67.	463.
11.4	13.0	13.0	.0	110.	888.	46.0	228.0	39.0	7.0	3876.	61.2	.0	181.	17.0	69.9	.017	-112.	927.
5.4	14.0	14.0	.0	110.	418.	18.0	215.1	37.4	7.0	1839.	58.0	.0	138.	17.0	69.9	2.888	-68.	438.
10.8	14.0	14.0	.0	110.	836.	46.9	227.1	37.4	7.0	3677.	61.0	.0	182.	17.0	69.9	.014	-114.	876.
5.1	15.0	15.0	.0	110.	394.	19.1	214.1	34.6	7.0	1750.	57.8	.0	141.	17.0	69.9	2.005	-71.	415.
10.2	15.0	15.0	.0	110.	788.	48.8	226.1	34.6	7.0	3499.	60.8	.0	186.	17.0	69.9	.009	-118.	829.
4.9	16.0	16.0	.0	110.	372.	23.8	213.2	33.0	7.0	1670.	57.5	.0	146.	17.0	69.9	1.056	-77.	394.
9.7	16.0	16.0	.0	110.	745.	54.4	225.2	33.0	7.0	3339.	60.5	.0	193.	17.0	69.9	.004	-124.	788.
4.6	17.0	17.0	.0	110.	353.	29.4	212.4	29.0	7.0	1598.	57.4	.0	155.	17.0	69.9	.378	-85.	375.
9.3	17.0	17.0	.0	110.	705.	60.9	224.4	29.0	7.0	3195.	60.4	.0	203.	17.0	69.9	.001	-134.	750.
4.4	18.0	18.0	.0	110.	335.	30.1	211.5	26.0	7.0	1533.	57.2	.0	158.	17.0	69.9	.263	-89.	358.
8.8	18.0	18.0	.0	110.	669.	62.7	223.5	26.0	7.0	3065.	60.2	.0	207.	17.0	69.9	.001	-138.	715.
4.2	19.0	19.0	.0	110.	318.	31.0	210.8	24.0	7.0	1474.	57.0	.0	161.	17.0	69.9	.204	-91.	342.
8.4	19.0	19.0	.0	110.	636.	64.7	222.8	24.0	7.0	2948.	60.0	.0	210.	17.0	69.9	.001	-141.	684.
4.0	20.0	20.0	.0	110.	303.	31.8	210.0	21.0	7.0	1421.	56.8	.0	164.	17.0	69.9	.139	-94.	328.
8.1	20.0	20.0	.0	110.	605.	66.8	222.0	21.0	7.0	2841.	59.8	.0	215.	17.0	69.9	.000	-146.	655.
3.9	21.0	21.0	.0	110.	289.	32.8	209.3	20.0	7.0	1372.	56.7	.0	165.	17.0	69.9	.119	-96.	314.
7.8	21.0	21.0	.0	110.	577.	69.1	221.3	20.0	7.0	2744.	59.7	.0	217.	17.0	69.9	.000	-149.	629.
3.7	22.0	22.0	.0	110.	276.	33.8	208.6	19.0	7.0	1328.	56.6	.0	167.	17.0	69.9	.100	-97.	302.
7.5	22.0	22.0	.0	110.	551.	71.6	220.6	19.0	7.0	2656.	59.6	.0	220.	17.0	69.9	.000	-152.	604.
3.6	23.0	23.0	.0	110.	263.	34.9	208.0	18.0	7.0	1288.	56.4	.0	168.	17.0	69.9	.084	-99.	291.
7.2	23.0	23.0	.0	110.	527.	74.2	220.0	18.0	7.0	2576.	59.4	.0	223.	17.0	69.9	.000	-155.	582.
3.5	24.0	24.0	.0	110.	252.	36.1	207.3	16.0	7.0	1251.	56.3	.0	171.	17.0	69.9	.062	-101.	281.
6.9	24.0	24.0	.0	110.	504.	77.0	219.3	16.0	7.0	2503.	59.3	.0	228.	17.0	69.9	.000	-159.	561.
3.3	25.0	25.0	.0	110.	241.	37.3	206.7	16.0	7.0	1218.	56.2	.0	172.	17.0	69.9	.057	-102.	271.
6.7	25.0	25.0	.0	110.	483.	80.1	218.7	16.0	7.0	2436.	59.2	.0	230.	17.0	69.9	.000	-161.	542.

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3.2	26.0	26.0	.0	110.	232.	38.6	206.1	15.0	7.0	1188.	56.1	.0	174.	17.0	69.9	.046	-104.	262.
6.5	26.0	26.0	.0	110.	463.	83.3	218.1	15.0	7.0	2376.	59.1	.0	234.	17.0	69.9	.000	-165.	524.
3.1	27.0	27.0	.0	110.	222.	40.0	205.6	13.8	7.0	1160.	56.0	.0	176.	17.0	69.9	.036	-106.	254.
6.3	27.0	27.0	.0	110.	444.	86.8	217.6	13.8	7.0	2320.	59.0	.0	238.	17.0	69.9	.000	-169.	507.
3.0	28.0	28.0	.0	110.	213.	41.5	205.0	9.0	7.0	1135.	55.9	.0	182.	17.0	69.9	.018	-112.	246.
6.1	28.0	28.0	.0	110.	427.	90.6	217.0	9.0	7.0	2270.	58.9	.0	246.	17.0	69.9	.000	-177.	492.
2.9	29.0	29.0	.0	110.	205.	43.1	204.5	8.0	7.0	1112.	55.8	.0	184.	17.0	69.9	.014	-114.	239.
5.9	29.0	29.0	.0	110.	410.	94.6	216.5	8.0	7.0	2224.	58.8	.0	251.	17.0	69.9	.000	-182.	477.
2.9	30.0	30.0	.0	110.	197.	44.8	204.0	4.0	7.0	1091.	55.7	.0	189.	17.0	69.9	.008	-119.	232.
5.7	30.0	30.0	.0	110.	395.	98.9	216.0	4.0	7.0	2182.	58.7	.0	259.	17.0	69.9	.000	-190.	464.

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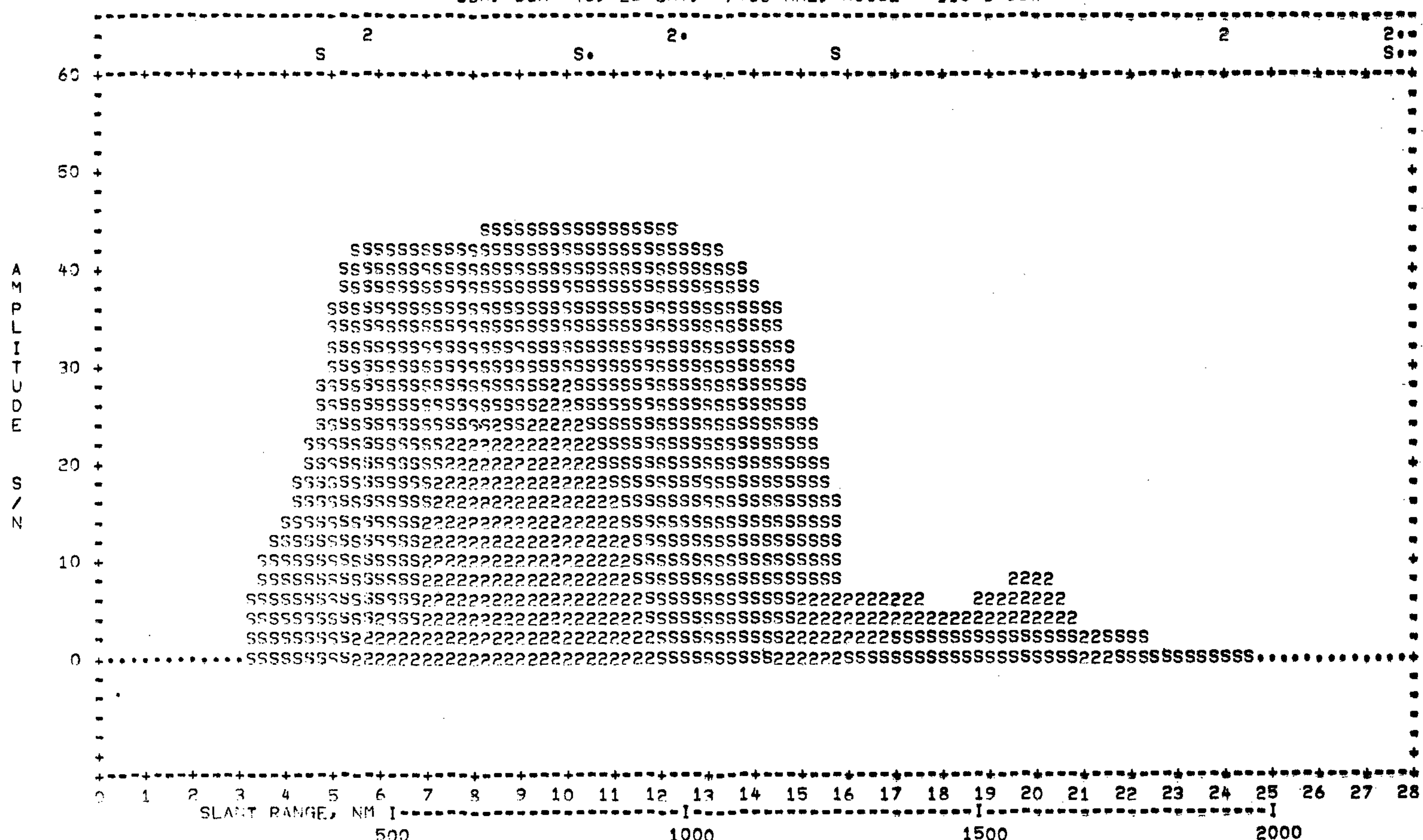
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 7.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	23.9	5.8	15.9	4.8
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	49.9	.0	16.5
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	48.2	.0	16.5
TILT	0000.0	0000.0	0000.0	0000.0	.1	.8	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	252.0	336.4	110.0	110.0
GROUND DISTANCE KM	0000.0	0000.0	0000.0	0000.0	1874.1	294.3	1269.4	363.0

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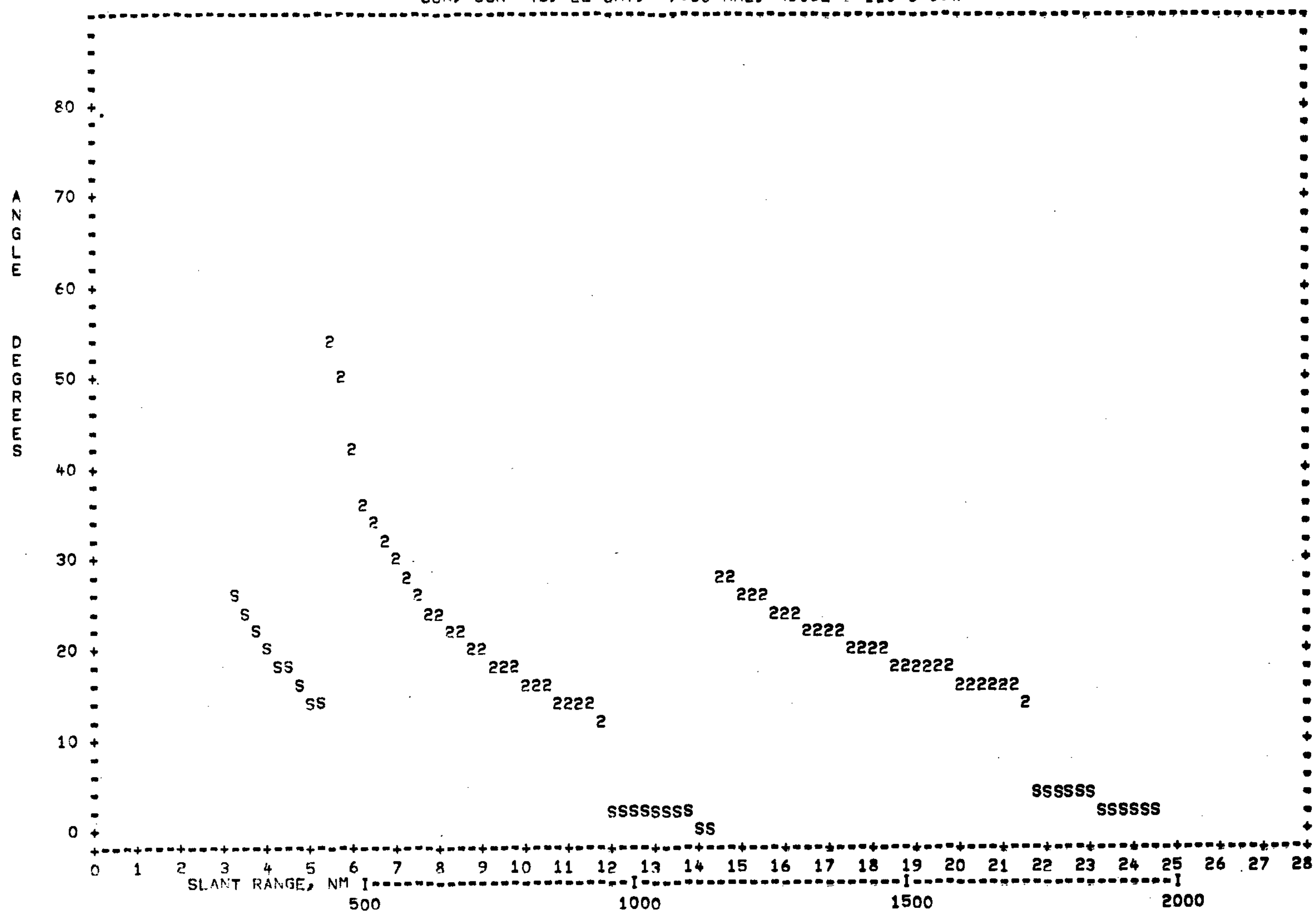
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 7.00 MHZ, NOISE = 110.0 DBW



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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 7.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
23.8	.0	.3	.1	252.	1874.	10.3	240.8	-31.0	7.0	7698.	64.2	48.4	266.	17.0	69.9	.000	-196.	1923.
22.2	2.5	.3	.1	252.	1747.	10.2	239.6	23.8	7.0	7288.	63.9	48.4	210.	17.0	69.9	.001	-141.	1797.
18.3	5.0	4.1	.1	252.	1435.	9.4	236.3	37.4	7.0	6067.	63.2	48.4	194.	17.0	69.9	.005	-124.	1485.
15.8	7.5	6.8	.1	253.	1229.	8.4	233.7	42.4	7.0	5257.	62.5	48.4	186.	17.0	69.9	.012	-116.	1281.
13.7	10.0	9.6	.1	254.	1059.	7.4	231.3	47.0	7.0	4600.	61.9	48.4	178.	17.0	69.9	.027	-108.	1113.
12.1	12.5	12.3	.0	255.	924.	6.6	229.1	48.8	7.0	4091.	61.4	48.4	174.	17.0	69.9	.045	-104.	981.
10.9	15.0	14.7	.1	256.	822.	5.9	227.2	49.0	7.0	3718.	61.0	25.0	148.	17.0	69.9	.872	-78.	883.
9.9	17.5	17.1	.1	259.	738.	5.3	225.6	48.6	7.0	3421.	60.7	9.7	131.	17.0	69.9	5.994	-61.	803.
9.1	20.0	19.5	.2	261.	666.	4.8	224.1	46.8	7.0	3180.	60.3	9.0	131.	17.0	69.9	6.438	-61.	735.
8.4	22.5	22.0	.2	264.	606.	4.4	222.7	44.0	7.0	2991.	60.1	8.3	131.	17.0	69.9	5.983	-61.	681.
7.8	24.9	24.7	.1	267.	551.	4.0	221.5	38.6	7.0	2837.	59.9	7.7	135.	17.0	69.9	4.048	-65.	632.
7.4	27.4	27.1	.1	271.	509.	3.7	220.4	33.4	7.0	2729.	59.7	7.2	138.	17.0	69.9	2.699	-68.	596.
7.0	29.9	29.5	.2	275.	472.	3.5	219.5	24.6	7.0	2651.	59.6	6.7	146.	17.0	69.9	1.162	-76.	566.
6.7	32.4	31.8	.3	280.	440.	3.3	218.8	17.0	7.0	2598.	59.5	6.3	152.	17.0	69.9	.563	-82.	542.
6.4	34.9	34.3	.3	286.	410.	3.1	218.1	10.0	7.0	2567.	59.4	6.0	158.	17.0	69.9	.289	-88.	520.
6.2	37.4	36.7	.3	292.	384.	2.9	217.5	7.4	7.0	2561.	59.4	5.7	159.	17.0	69.9	.241	-89.	504.
6.1	39.9	38.6	.6	298.	364.	2.8	217.1	5.4	7.0	2565.	59.4	5.4	160.	17.0	69.9	.210	-91.	492.
6.0	42.4	40.7	.8	305.	345.	2.7	216.8	2.6	7.0	2597.	59.5	5.2	163.	17.0	69.9	.165	-93.	483.
5.9	44.9	42.8	1.0	313.	328.	2.6	216.5	-10.0	7.0	2646.	59.5	5.0	175.	17.0	69.9	.041	-105.	477.
5.8	47.4	45.4	.9	323.	310.	2.5	216.4	-10.0	7.0	2736.	59.7	4.8	174.	17.0	69.9	.044	-104.	472.
5.8	49.9	48.2	.8	336.	294.	2.4	216.4	-10.0	7.0	2888.	59.9	4.7	174.	17.0	69.9	.047	-104.	472.
5.8	50.9	49.2	.8	336.	284.	2.3	216.2	-10.0	7.0	2906.	60.0	4.7	173.	17.0	69.9	.033	-107.	466.
5.7	51.9	50.2	.8	336.	275.	2.3	215.9	-10.0	7.0	2927.	60.0	4.6	173.	17.0	69.9	.032	-107.	460.
5.6	52.9	51.2	.8	336.	265.	2.3	215.7	-10.0	7.0	2953.	60.0	4.6	173.	17.0	69.9	.030	-107.	454.
5.5	53.9	52.2	.8	336.	256.	2.2	215.5	-10.0	7.0	2982.	60.1	4.5	172.	17.0	69.9	.029	-108.	448.
5.5	54.9	53.2	.8	336.	247.	2.2	215.3	-10.0	7.0	3015.	60.1	4.5	172.	17.0	69.9	.027	-108.	443.
5.4	55.9	54.2	.8	336.	238.	2.2	215.1	-10.0	7.0	3052.	60.2	4.5	172.	17.0	69.9	.026	-109.	438.
5.4	56.9	55.2	.8	336.	230.	2.2	214.9	-10.0	7.0	3094.	60.2	4.4	171.	17.0	69.9	.024	-109.	433.
5.3	57.9	56.2	.8	336.	221.	2.1	214.7	-10.0	7.0	3140.	60.3	4.4	171.	17.0	69.9	.023	-110.	429.
5.2	58.9	57.2	.8	336.	213.	2.1	214.5	-10.0	7.0	3192.	60.4	4.4	171.	17.0	69.9	.021	-110.	424.
5.2	59.9	58.2	.8	336.	205.	2.1	214.3	-10.0	7.0	3249.	60.4	4.4	170.	17.0	69.9	.020	-111.	420.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
37.5	4.1	3.9	.1	256.	1496.	9.5	12.7	.0	7.0	12385.	66.3	9.3	222.	17.0	69.9	.000	-152.	3032.
32.3	6.8	6.4	.1	257.	1280.	8.5	12.6	.0	7.0	10719.	65.6	8.6	212.	17.0	69.9	.001	-142.	2614.
27.9	9.6	9.3	.1	258.	1091.	7.5	12.6	.0	7.0	9328.	65.0	7.7	203.	17.0	69.9	.002	-133.	2259.
24.5	12.3	12.1	.2	259.	947.	6.5	12.5	.0	7.0	8273.	64.5	6.7	196.	17.0	69.9	.003	-127.	1985.
22.1	14.7	14.5	.1	261.	843.	5.9	12.5	.0	7.0	7522.	64.1	5.8	169.	17.0	69.9	.077	-99.	1787.
20.1	17.1	16.8	.1	264.	761.	5.3	12.6	.0	7.0	6939.	63.7	5.1	151.	17.0	69.9	.611	-81.	1630.
18.4	19.5	19.5	.0	267.	685.	4.8	12.5	.0	7.0	6446.	63.4	4.3	149.	17.0	69.9	.762	-79.	1491.
17.1	22.0	21.7	.3	270.	628.	4.4	12.6	.0	7.0	6071.	63.2	3.6	149.	17.0	69.9	.795	-79.	1384.
15.9	24.7	24.5	.2	275.	572.	4.0	12.6	.0	7.0	5764.	62.9	3.0	151.	17.0	69.9	.605	-81.	1287.
15.0	27.1	27.0	.1	280.	528.	3.7	12.6	.0	7.0	5554.	62.8	2.5	154.	17.0	69.9	.441	-84.	1214.
14.3	29.5	29.0	.4	285.	495.	3.5	12.7	.0	7.0	5397.	62.6	2.1	161.	17.0	69.9	.203	-91.	1159.
13.7	31.8	31.3	.4	291.	465.	3.3	12.8	.0	7.0	5304.	62.6	1.7	167.	17.0	69.9	.104	-97.	1112.
13.2	34.3	34.3	.1	298.	432.	3.1	12.7	.0	7.0	5261.	62.5	1.4	172.	17.0	69.9	.057	-102.	1067.
12.8	36.7	35.9	.7	305.	411.	2.9	12.8	.0	7.0	5226.	62.5	1.1	173.	17.0	69.9	.049	-103.	1038.
12.6	38.6	38.2	.4	313.	392.	2.8	12.9	.0	7.0	5270.	62.5	1.0	174.	17.0	69.9	.044	-104.	1017.
12.4	40.7	39.6	1.0	320.	378.	2.7	12.9	.0	7.0	5305.	62.6	.8	176.	17.0	69.9	.035	-106.	1003.
12.2	42.8	42.2	.5	330.	359.	2.6	12.9	.0	7.0	5443.	62.7	.7	188.	17.0	69.9	.009	-118.	989.
12.2	45.4	43.8	1.4	344.	349.	2.5	13.1	.0	7.0	5576.	62.8	.5	190.	17.0	69.9	.007	-120.	987.
11.9	48.2	46.6	1.4	344.	317.	2.4	12.7	.0	7.0	5736.	62.9	.4	191.	17.0	69.9	.006	-121.	966.
11.8	49.2	47.7	1.4	344.	307.	2.4	12.7	.0	7.0	5764.	62.9	.4	195.	17.0	69.9	.004	-125.	953.
11.6	50.2	48.7	1.4	344.	296.	2.3	12.7	.0	7.0	5798.	63.0	.3	197.	17.0	69.9	.003	-127.	940.
11.5	51.2	49.7	1.4	344.	286.	2.3	12.7	.0	7.0	5840.	63.0	.3	198.	17.0	69.9	.003	-128.	928.
11.3	52.2	50.7	1.4	344.	277.	2.3	12.7	.0	7.0	5889.	63.0	.3	199.	17.0	69.9	.002	-129.	916.
11.2	53.2	51.7	1.4	344.	267.	2.2	12.7	.0	7.0	5945.	63.1	.3	201.	17.0	69.9	.002	-131.	905.
11.0	54.2	52.7	1.4	344.	258.	2.2	12.6	.0	7.0	6009.	63.1	.2	202.	17.0	69.9	.002	-132.	894.
10.9	55.2	53.7	1.4	344.	249.	2.2	12.6	.0	7.0	6082.	63.2	.2	204.	17.0	69.9	.001	-134.	884.
10.8	56.2	54.7	1.4	344.	240.	2.1	12.6	.0	7.0	6163.	63.2	.2	206.	17.0	69.9	.001	-136.	874.
10.7	57.2	55.7	1.4	344.	231.	2.1	12.6	.0	7.0	6253.	63.3	.2	207.	17.0	69.9	.001	-137.	865.
10.6	58.2	56.7	1.4	344.	223.	2.1	12.6	.0	7.0	6354.	63.4	.2	209.	17.0	69.9	.001	-139.	856.

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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 7.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	17.9	233.7	-31.0	7.0	5232.	62.5	.0	220.	17.0	69.9	.000	-150.	1284.
31.7	.0	.0	.0	110.	2539.	41.3	245.7	-31.0	7.0	10464.	65.5	.0	259.	17.0	69.9	.000	-189.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	232.1	13.0	7.0	4766.	62.1	.0	175.	17.0	69.9	.040	-105.	1169.
28.9	1.0	1.0	.0	110.	2310.	41.3	244.1	13.0	7.0	9533.	65.1	.0	214.	17.0	69.9	.000	-149.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	230.5	23.8	7.0	4347.	61.7	.0	163.	17.0	69.9	.158	-93.	1066.
26.3	2.0	2.0	.0	110.	2103.	41.4	242.5	23.8	7.0	8694.	64.7	.0	202.	17.0	69.9	.001	-137.	2132.
12.0	3.0	3.0	.0	110.	959.	17.9	228.9	30.0	7.0	3972.	61.3	.0	156.	17.0	69.9	.370	-86.	973.
24.1	3.0	3.0	.0	110.	1918.	41.6	240.9	30.0	7.0	7944.	64.3	.0	195.	17.0	69.9	.002	-129.	1947.
11.0	4.0	4.0	.0	110.	876.	17.9	227.4	34.0	7.0	3639.	60.9	.0	150.	17.0	69.9	.671	-80.	891.
22.0	4.0	4.0	.0	110.	1752.	41.7	239.4	34.0	7.0	7278.	63.9	.0	190.	17.0	69.9	.005	-124.	1782.
10.1	5.0	5.0	.0	110.	802.	17.9	225.9	37.4	7.0	3344.	60.6	.0	146.	17.0	69.9	1.130	-76.	817.
20.2	5.0	5.0	.0	110.	1605.	42.0	237.9	37.4	7.0	6688.	63.6	.0	186.	17.0	69.9	.008	-119.	1635.
9.3	6.0	6.0	.0	110.	737.	17.9	224.5	41.0	7.0	3084.	60.2	.0	141.	17.0	69.9	1.938	-71.	753.
18.6	6.0	6.0	.0	110.	1474.	42.3	236.5	41.0	7.0	6167.	63.2	.0	181.	17.0	69.9	.014	-114.	1505.
8.6	7.0	7.0	.0	110.	679.	17.9	223.1	42.4	7.0	2854.	59.9	.0	139.	17.0	69.9	2.567	-69.	695.
17.2	7.0	7.0	.0	110.	1359.	42.6	235.1	42.4	7.0	5708.	62.9	.0	179.	17.0	69.9	.018	-112.	1390.
8.0	8.0	8.0	.0	110.	628.	17.9	221.8	45.0	7.0	2651.	59.6	.0	135.	17.0	69.9	3.886	-65.	644.
15.9	8.0	8.0	.0	110.	1256.	43.1	233.8	45.0	7.0	5302.	62.6	.0	176.	17.0	69.9	.027	-108.	1288.
7.4	9.0	9.0	.0	110.	583.	17.9	220.5	45.8	7.0	2472.	59.3	.0	133.	17.0	69.9	4.756	-63.	599.
14.8	9.0	9.0	.0	110.	1165.	43.5	232.5	45.8	7.0	4944.	62.3	.0	175.	17.0	69.9	.032	-107.	1198.
6.9	10.0	10.0	.0	110.	542.	17.9	219.3	47.0	7.0	2314.	59.0	.0	131.	17.0	69.9	6.066	-61.	559.
13.8	10.0	10.0	.0	110.	1084.	44.0	231.3	47.0	7.0	4628.	62.0	.0	173.	17.0	69.9	.039	-105.	1118.
6.5	11.0	11.0	.0	110.	506.	17.9	218.2	47.4	7.0	2174.	58.7	.0	130.	17.0	69.9	7.022	-60.	524.
12.9	11.0	11.0	.0	110.	1012.	44.6	230.2	47.4	7.0	4347.	61.7	.0	172.	17.0	69.9	.043	-104.	1047.
6.1	12.0	12.0	.0	110.	473.	17.9	217.1	48.8	7.0	2049.	58.4	.0	128.	17.0	69.9	9.079	-58.	492.
12.2	12.0	12.0	.0	110.	947.	45.3	229.1	48.8	7.0	4098.	61.4	.0	171.	17.0	69.9	.053	-103.	984.
5.7	13.0	13.0	.0	110.	444.	17.9	216.0	48.8	7.0	1938.	58.2	.0	127.	17.0	69.9	9.947	-57.	463.
11.4	13.0	13.0	.0	110.	888.	46.0	228.0	48.8	7.0	3876.	61.2	.0	171.	17.0	69.9	.054	-102.	927.
5.4	14.0	14.0	.0	110.	418.	18.0	215.1	49.0	7.0	1839.	58.0	.0	126.	17.0	69.9	10.979	-56.	438.
10.8	14.0	14.0	.0	110.	836.	46.9	227.1	49.0	7.0	3677.	61.0	.0	171.	17.0	69.9	.055	-102.	876.
5.1	15.0	15.0	.0	110.	394.	19.1	214.1	49.0	7.0	1750.	57.8	.0	126.	17.0	69.9	10.520	-57.	415.
10.2	15.0	15.0	.0	110.	788.	48.8	226.1	49.0	7.0	3499.	60.8	.0	172.	17.0	69.9	.048	-103.	829.
4.9	16.0	16.0	.0	110.	372.	23.8	213.2	48.8	7.0	1670.	57.5	.0	131.	17.0	69.9	6.514	-61.	394.
9.7	16.0	16.0	.0	110.	745.	54.4	225.2	48.8	7.0	3339.	60.5	.0	177.	17.0	69.9	.027	-108.	788.
4.6	17.0	17.0	.0	110.	353.	29.4	212.4	48.6	7.0	1598.	57.4	.0	136.	17.0	69.9	3.608	-66.	375.
9.3	17.0	17.0	.0	110.	705.	60.9	224.4	48.6	7.0	3195.	60.4	.0	183.	17.0	69.9	.013	-114.	750.
4.4	18.0	18.0	.0	110.	335.	30.1	211.5	48.0	7.0	1533.	57.2	.0	136.	17.0	69.9	3.314	-67.	358.
8.8	18.0	18.0	.0	110.	669.	62.7	223.5	48.0	7.0	3065.	60.2	.0	185.	17.0	69.9	.011	-116.	715.
4.2	19.0	19.0	.0	110.	318.	31.0	210.8	47.4	7.0	1474.	57.0	.0	137.	17.0	69.9	3.016	-67.	342.
8.4	19.0	19.0	.0	110.	636.	64.7	222.8	47.4	7.0	2948.	60.0	.0	187.	17.0	69.9	.009	-118.	684.
4.0	20.0	20.0	.0	110.	303.	31.8	210.0	46.8	7.0	1421.	56.8	.0	138.	17.0	69.9	2.718	-68.	328.
8.1	20.0	20.0	.0	110.	605.	66.8	222.0	46.8	7.0	2841.	59.8	.0	189.	17.0	69.9	.007	-120.	655.
3.9	21.0	21.0	.0	110.	289.	32.8	209.3	45.4	7.0	1372.	56.7	.0	140.	17.0	69.9	2.213	-70.	314.
7.8	21.0	21.0	.0	110.	577.	69.1	221.3	45.4	7.0	2744.	59.7	.0	192.	17.0	69.9	.005	-123.	629.
3.7	22.0	22.0	.0	110.	276.	33.8	208.6	44.0	7.0	1328.	56.6	.0	142.	17.0	69.9	1.784	-72.	302.
7.5	22.0	22.0	.0	110.	551.	71.6	220.6	44.0	7.0	2656.	59.6	.0	195.	17.0	69.9	.003	-127.	604.
3.6	23.0	23.0	.0	110.	263.	34.9	208.0	42.4	7.0	1288.	56.4	.0	144.	17.0	69.9	1.391	-74.	291.
7.2	23.0	23.0	.0	110.	527.	74.2	220.0	42.4	7.0	2576.	59.4	.0	199.	17.0	69.9	.002	-130.	582.
3.5	24.0	24.0	.0	110.	252.	36.1	207.3	41.0	7.0	1251.	56.3	.0	146.	17.0	69.9	1.098	-76.	281.
6.9	24.0	24.0	.0	110.	504.	77.0	219.3	41.0	7.0	2503.	59.3	.0	203.	17.0	69.9	.001	-134.	561.
3.3	25.0	25.0	.0	110.	241.	37.3	206.7	38.6	7.0	1218.	56.2	.0	149.	17.0	69.9	.765	-79.	271.
6.7	25.0	25.0	.0	110.	483.	80.1	218.7	38.6	7.0	2436.	59.2	.0	208.	17.0	69.9	.001	-139.	542.

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3.2	26.0	26.0	.0	110.	232.	38.6	206.1	36.6	7.0	1188.	56.1	.0	152.	17.0	69.9	.551	-82.	262.
6.5	26.0	26.0	.0	110.	463.	83.3	218.1	36.6	7.0	2376.	59.1	.0	213.	17.0	69.9	.000	-144.	524.
3.1	27.0	27.0	.0	110.	222.	40.0	205.6	33.4	7.0	1160.	56.0	.0	156.	17.0	69.9	.342	-86.	254.
6.3	27.0	27.0	.0	110.	444.	86.8	217.6	33.4	7.0	2320.	59.0	.0	219.	17.0	69.9	.000	-150.	507.
3.0	28.0	28.0	.0	110.	213.	41.5	205.0	30.8	7.0	1135.	55.9	.0	160.	17.0	69.9	.225	-90.	246.
6.1	28.0	28.0	.0	110.	427.	90.6	217.0	30.8	7.0	2270.	58.9	.0	225.	17.0	69.9	.000	-156.	492.
2.9	29.0	29.0	.0	110.	205.	43.1	204.5	28.8	7.0	1112.	55.8	.0	163.	17.0	69.9	.157	-93.	239.
5.9	29.0	29.0	.0	110.	410.	94.6	216.5	28.8	7.0	2224.	58.8	.0	230.	17.0	69.9	.000	-161.	477.
2.9	30.0	30.0	.0	110.	197.	44.8	204.0	24.6	7.0	1091.	55.7	.0	168.	17.0	69.9	.083	-99.	232.
5.7	30.0	30.0	.0	110.	395.	98.9	216.0	24.6	7.0	2182.	58.7	.0	238.	17.0	69.9	.000	-169.	464.

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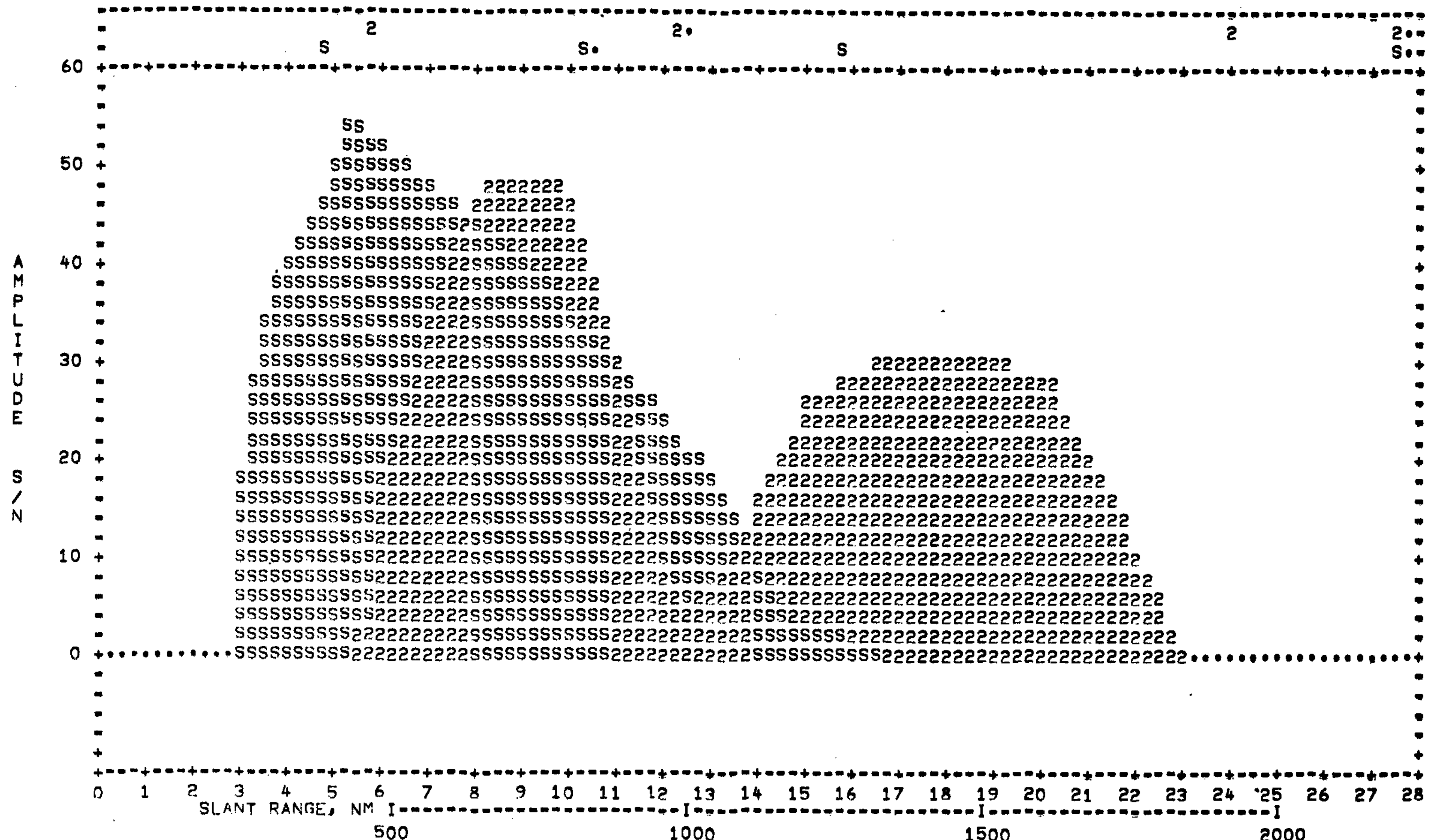
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 7.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	23.9	5.8	15.9	4.8
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	49.9	.0	16.5
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	48.2	.0	16.5
TILT	0000.0	0000.0	0000.0	0000.0	.1	.8	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	252.0	336.4	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	2024.5	317.9	1371.3	392.1

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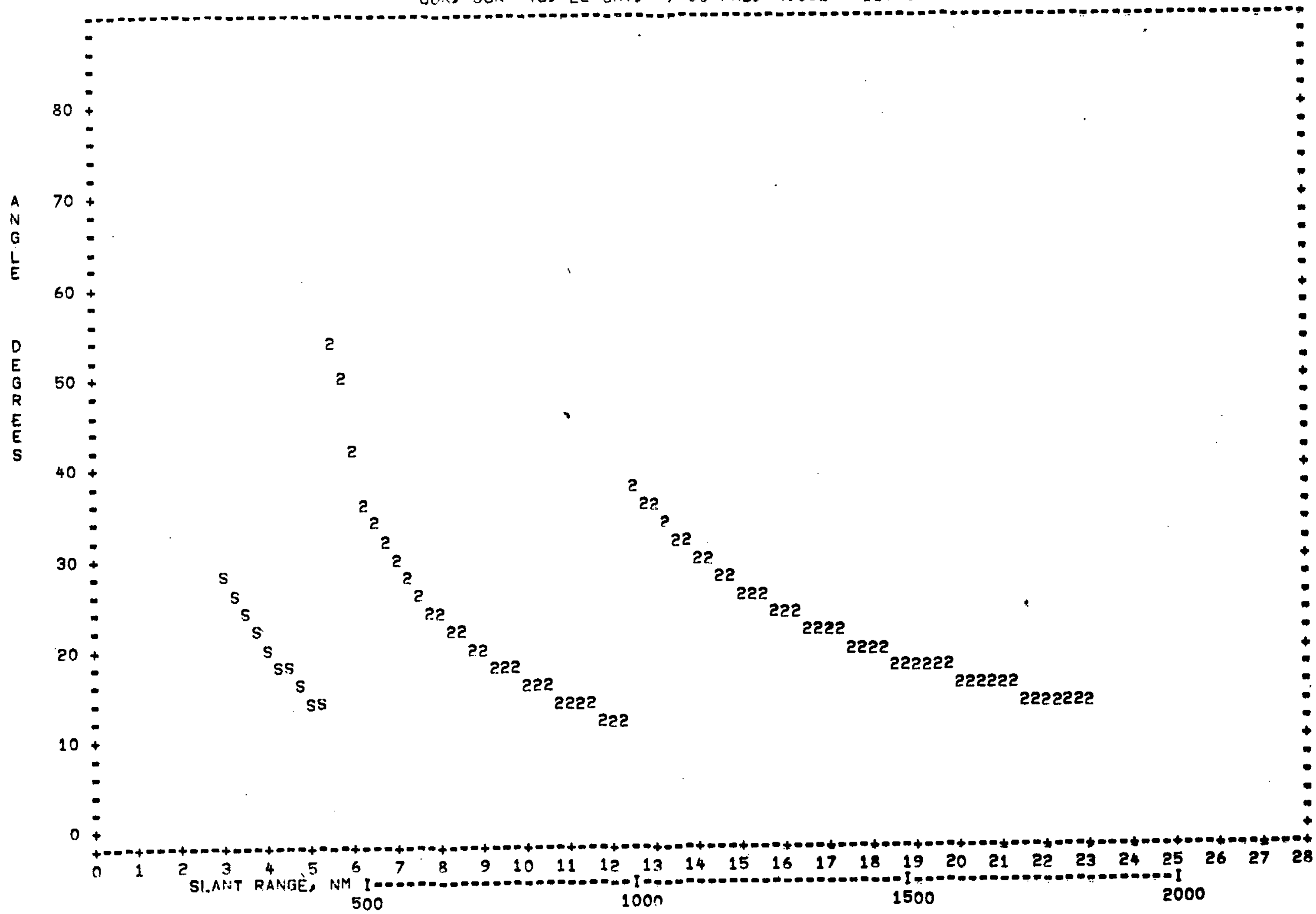
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 7.00 MHZ, NOISE = 110.0 DBW



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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 9.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
23.9	.0	.3	.1	255.	1885.	7.0	245.3	25.0	7.0	7697.	66.4	48.4	209.	17.0	69.9	.001	-139.	1935.
22.7	1.7	.3	.2	255.	1791.	7.0	244.4	49.0	7.0	7349.	66.2	48.4	185.	17.0	69.9	.013	-115.	1841.
21.9	3.4	.3	.2	256.	1719.	6.8	243.7	49.8	7.0	7201.	66.1	48.4	183.	17.0	69.9	.015	-113.	1770.
18.3	5.1	4.4	.1	256.	1430.	6.4	240.6	48.8	7.0	6056.	65.3	48.4	181.	17.0	69.9	.019	-111.	1481.
16.7	6.8	6.1	.1	257.	1297.	5.9	239.0	46.0	7.0	5532.	64.9	48.4	182.	17.0	69.9	.017	-113.	1350.
15.2	8.5	7.8	.1	259.	1178.	5.5	237.4	43.6	7.0	5068.	64.6	40.6	175.	17.0	69.9	.038	-105.	1232.
14.1	10.2	9.3	.2	260.	1083.	5.1	236.0	40.6	7.0	4702.	64.2	15.0	151.	17.0	69.9	.603	-81.	1139.
12.9	11.9	11.1	.2	261.	990.	4.7	234.6	39.8	7.0	4350.	63.9	9.6	145.	17.0	69.9	1.214	-75.	1048.
12.0	13.6	13.0	.2	264.	908.	4.3	233.2	37.4	7.0	4054.	63.6	9.1	146.	17.0	69.9	1.159	-76.	969.
11.1	15.3	15.1	.1	266.	834.	3.9	231.9	34.6	7.0	3788.	63.3	8.5	146.	17.0	69.9	1.051	-77.	897.
10.5	17.0	16.4	.2	269.	784.	3.7	231.0	29.0	7.0	3617.	63.1	8.0	151.	17.0	69.9	.654	-81.	851.
10.0	18.7	17.7	.3	273.	741.	3.5	230.1	24.0	7.0	3470.	62.9	7.5	154.	17.0	69.9	.431	-84.	811.
9.5	20.4	19.3	.4	276.	698.	3.3	229.3	21.0	7.0	3335.	62.7	7.1	156.	17.0	69.9	.355	-86.	773.
9.1	22.1	21.0	.4	281.	658.	3.1	228.5	19.0	7.0	3219.	62.6	6.6	157.	17.0	69.9	.327	-87.	737.
8.7	23.8	23.1	.3	286.	618.	2.9	227.7	16.0	7.0	3114.	62.4	6.3	158.	17.0	69.9	.267	-88.	703.
8.4	25.5	24.7	.3	292.	590.	2.7	227.1	16.0	7.0	3053.	62.4	6.0	157.	17.0	69.9	.298	-88.	681.
8.2	27.1	25.4	.7	297.	573.	2.6	226.8	13.8	7.0	3011.	62.3	5.7	159.	17.0	69.9	.250	-89.	667.
8.0	28.8	27.0	.7	304.	550.	2.5	226.3	8.0	7.0	2980.	62.2	5.4	164.	17.0	69.9	.140	-94.	651.
7.9	30.5	28.7	.8	312.	530.	2.4	226.0	-10.0	7.0	2969.	62.2	5.2	181.	17.0	69.9	.019	-111.	639.
7.8	32.2	30.4	.8	322.	514.	2.3	225.8	-10.0	7.0	2982.	62.3	5.0	181.	17.0	69.9	.020	-111.	631.
7.8	33.9	32.1	.8	336.	503.	2.2	225.8	-10.0	7.0	3038.	62.3	4.8	180.	17.0	69.9	.021	-111.	631.
7.6	34.9	33.2	.8	336.	486.	2.1	225.4	-10.0	7.0	3004.	62.3	4.8	180.	17.0	69.9	.014	-114.	617.
7.5	35.9	34.2	.8	336.	470.	2.1	225.0	-10.0	7.0	2973.	62.2	4.7	180.	17.0	69.9	.012	-115.	604.
7.3	36.9	35.2	.8	336.	454.	2.0	224.6	-10.0	7.0	2946.	62.2	4.6	179.	17.0	69.9	.010	-117.	591.
7.1	37.9	36.2	.8	336.	439.	2.0	224.3	-10.0	7.0	2922.	62.2	4.5	179.	17.0	69.9	.009	-118.	579.
7.0	38.9	37.2	.8	336.	425.	1.9	223.9	-10.0	7.0	2902.	62.1	4.5	178.	17.0	69.9	.007	-120.	567.
6.9	39.9	38.2	.8	336.	411.	1.9	223.6	-10.0	7.0	2885.	62.1	4.4	178.	17.0	69.9	.006	-122.	556.
6.7	40.9	39.2	.8	336.	397.	1.9	223.3	-10.0	7.0	2871.	62.1	4.4	177.	17.0	69.9	.004	-124.	546.
6.6	41.9	40.2	.8	336.	384.	1.8	222.9	-10.0	7.0	2861.	62.1	4.4	177.	17.0	69.9	.003	-127.	536.
6.5	42.9	41.2	.8	336.	372.	1.8	222.6	-10.0	7.0	2853.	62.1	4.3	177.	17.0	69.9	.002	-129.	527.
6.4	43.9	42.2	.8	336.	359.	1.8	222.3	-10.0	7.0	2849.	62.1	4.3	176.	17.0	69.9	.002	-132.	518.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
37.4	4.4	4.0	.1	261.	2923.	6.4	12.7	.0	7.0	12368.	68.4	7.4	205.	17.0	69.9	.001	-135.	3028.
34.0	6.1	5.9	.1	262.	2643.	6.0	12.6	.0	7.0	11267.	68.0	6.9	205.	17.0	69.9	.001	-135.	2750.
31.1	7.8	7.4	.2	264.	2408.	5.6	12.7	.0	7.0	10347.	67.7	6.3	197.	17.0	69.9	.003	-127.	2518.
28.9	9.3	8.8	.2	265.	2223.	5.2	12.7	.0	7.0	9631.	67.3	5.8	172.	17.0	69.9	.056	-102.	2336.
26.5	11.1	10.8	.2	267.	2025.	4.8	12.7	.0	7.0	8888.	67.0	5.1	165.	17.0	69.9	.129	-95.	2142.
24.5	13.0	12.6	.3	270.	1857.	4.4	12.7	.0	7.0	8266.	66.7	4.4	164.	17.0	69.9	.140	-94.	1980.
22.6	15.1	14.6	.3	275.	1703.	4.0	12.7	.0	7.0	7717.	66.4	3.8	164.	17.0	69.9	.143	-94.	1833.
21.5	16.4	15.9	.4	277.	1608.	3.7	12.7	.0	7.0	7388.	66.2	3.4	167.	17.0	69.9	.095	-97.	1744.
20.5	17.7	17.4	.2	280.	1520.	3.5	12.7	.0	7.0	7102.	66.0	3.0	170.	17.0	69.9	.067	-100.	1663.
19.6	19.3	18.6	.4	284.	1439.	3.3	12.8	.0	7.0	6837.	65.9	2.6	171.	17.0	69.9	.059	-102.	1590.
18.8	21.0	20.3	.5	290.	1361.	3.1	12.8	.0	7.0	6608.	65.7	2.2	172.	17.0	69.9	.058	-102.	1521.
17.8	23.1	23.0	.1	298.	1270.	2.9	12.7	.0	7.0	6387.	65.6	1.7	173.	17.0	69.9	.052	-103.	1443.
17.3	24.7	24.1	.5	304.	1220.	2.7	12.8	.0	7.0	6263.	65.5	1.4	171.	17.0	69.9	.060	-101.	1403.
17.0	25.4	25.0	.4	308.	1189.	2.7	12.9	.0	7.0	6204.	65.4	1.3	173.	17.0	69.9	.051	-103.	1380.
16.6	27.0	26.9	.1	316.	1141.	2.5	12.9	.0	7.0	6149.	65.4	1.1	177.	17.0	69.9	.030	-107.	1346.
16.4	28.7	28.5	.2	329.	1106.	2.4	13.0	.0	7.0	6154.	65.4	.9	194.	17.0	69.9	.004	-125.	1327.
16.5	30.4	28.2	1.8	342.	1095.	2.4	13.3	.0	7.0	6161.	65.4	.7	194.	17.0	69.9	.004	-124.	1332.
16.1	32.1	30.3	1.5	343.	1049.	2.3	12.8	.0	7.0	6149.	65.4	.6	198.	17.0	69.9	.003	-128.	1303.
15.7	33.2	31.3	1.5	343.	1013.	2.2	12.8	.0	7.0	6071.	65.3	.5	204.	17.0	69.9	.001	-134.	1272.
15.4	34.2	32.4	1.5	343.	978.	2.1	12.8	.0	7.0	6000.	65.3	.4	207.	17.0	69.9	.001	-137.	1244.
15.0	35.2	33.4	1.5	343.	945.	2.1	12.8	.0	7.0	5937.	65.2	.4	210.	17.0	69.9	.001	-141.	1216.
14.7	36.2	34.4	1.5	343.	913.	2.0	12.8	.0	7.0	5881.	65.2	.3	215.	17.0	69.9	.000	-145.	1191.
14.4	37.2	35.4	1.5	343.	883.	2.0	12.8	.0	7.0	5832.	65.2	.3	219.	17.0	69.9	.000	-149.	1166.
14.1	38.2	36.4	1.5	343.	854.	2.0	12.8	.0	7.0	5790.	65.1	.3	224.	17.0	69.9	.000	-154.	1143.
13.8	39.2	37.5	1.5	343.	826.	1.9	12.8	.0	7.0	5755.	65.1	.2	230.	17.0	69.9	.000	-160.	1121.
13.6	40.2	38.5	1.5	343.	798.	1.9	12.7	.0	7.0	5726.	65.1	.2	235.	17.0	69.9	.000	-166.	1100.
13.3	41.2	39.5	1.5	343.	772.	1.8	12.7	.0	7.0	5704.	65.1	.2	241.	17.0	69.9	.000	-172.	1080.
13.1	42.2	40.5	1.5	343.	747.	1.8	12.7	.0	7.0	5688.	65.1	.1	248.	17.0	69.9	.000	-178.	1061.

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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 9.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	17.9	238.1	25.0	7.0	5232.	64.7	.0	166.	17.0	69.9	.107	-96.	1284.
31.7	.0	.0	.0	110.	2539.	43.4	250.1	25.0	7.0	10464.	67.7	.0	208.	17.0	69.9	.001	-138.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	236.5	44.6	7.0	4766.	64.3	.0	146.	17.0	69.9	1.174	-76.	1169.
28.9	1.0	1.0	.0	110.	2310.	43.4	248.5	44.6	7.0	9533.	67.3	.0	187.	17.0	69.9	.006	-121.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	234.9	49.0	7.0	4347.	63.9	.0	140.	17.0	69.9	2.240	-70.	1066.
26.3	2.0	2.0	.0	110.	2103.	43.5	246.9	49.0	7.0	8694.	66.9	.0	181.	17.0	69.9	.011	-116.	2132.
12.0	3.0	3.0	.0	110.	959.	17.9	233.3	49.8	7.0	3972.	63.5	.0	138.	17.0	69.9	2.816	-68.	973.
24.1	3.0	3.0	.0	110.	1918.	43.8	245.3	49.8	7.0	7944.	66.5	.0	180.	17.0	69.9	.014	-114.	1947.
11.0	4.0	4.0	.0	110.	876.	17.9	231.8	49.4	7.0	3639.	63.1	.0	137.	17.0	69.9	3.073	-67.	891.
22.0	4.0	4.0	.0	110.	1752.	44.1	243.8	49.4	7.0	7278.	66.1	.0	179.	17.0	69.9	.016	-113.	1782.
10.1	5.0	5.0	.0	110.	802.	17.9	230.3	48.8	7.0	3344.	62.7	.0	137.	17.0	69.9	3.265	-67.	817.
20.2	5.0	5.0	.0	110.	1605.	44.5	242.3	48.8	7.0	6688.	65.7	.0	179.	17.0	69.9	.017	-112.	1635.
9.3	6.0	6.0	.0	110.	737.	17.9	228.8	47.6	7.0	3084.	62.4	.0	137.	17.0	69.9	3.222	-67.	753.
18.6	6.0	6.0	.0	110.	1474.	45.0	240.8	47.6	7.0	6167.	65.4	.0	180.	17.0	69.9	.016	-113.	1505.
8.6	7.0	7.0	.0	110.	679.	17.9	227.5	46.0	7.0	2854.	62.1	.0	137.	17.0	69.9	3.022	-67.	695.
17.2	7.0	7.0	.0	110.	1359.	45.7	239.5	46.0	7.0	5708.	65.1	.0	181.	17.0	69.9	.015	-114.	1390.
8.0	8.0	8.0	.0	110.	628.	17.9	226.1	43.6	7.0	2651.	61.7	.0	139.	17.0	69.9	2.572	-69.	644.
15.9	8.0	8.0	.0	110.	1256.	46.4	238.1	43.6	7.0	5302.	64.7	.0	183.	17.0	69.9	.012	-116.	1288.
7.4	9.0	9.0	.0	110.	583.	18.4	224.9	41.4	7.0	2472.	61.4	.0	140.	17.0	69.9	2.105	-71.	599.
14.8	9.0	9.0	.0	110.	1165.	47.7	236.9	41.4	7.0	4944.	64.4	.0	186.	17.0	69.9	.009	-118.	1198.
6.9	10.0	10.0	.0	110.	542.	21.3	223.7	40.6	7.0	2314.	61.1	.0	143.	17.0	69.9	1.524	-73.	559.
13.8	10.0	10.0	.0	110.	1084.	51.6	235.7	40.6	7.0	4628.	64.1	.0	189.	17.0	69.9	.006	-121.	1118.
6.5	11.0	11.0	.0	110.	506.	29.2	222.5	40.6	7.0	2174.	60.9	.0	150.	17.0	69.9	.683	-80.	524.
12.9	11.0	11.0	.0	110.	1012.	60.5	234.5	40.6	7.0	4347.	63.9	.0	197.	17.0	69.9	.002	-129.	1047.
6.1	12.0	12.0	.0	110.	473.	30.0	221.4	39.8	7.0	2049.	60.6	.0	151.	17.0	69.9	.620	-81.	492.
12.2	12.0	12.0	.0	110.	947.	62.5	233.4	39.8	7.0	4098.	63.6	.0	199.	17.0	69.9	.002	-131.	984.
5.7	13.0	13.0	.0	110.	444.	31.0	220.4	39.0	7.0	1938.	60.4	.0	152.	17.0	69.9	.555	-82.	463.
11.4	13.0	13.0	.0	110.	888.	64.8	232.4	39.0	7.0	3876.	63.4	.0	202.	17.0	69.9	.002	-133.	927.
5.4	14.0	14.0	.0	110.	418.	32.1	219.4	37.4	7.0	1839.	60.2	.0	154.	17.0	69.9	.446	-84.	438.
10.8	14.0	14.0	.0	110.	836.	67.3	231.4	37.4	7.0	3677.	63.2	.0	205.	17.0	69.9	.001	-137.	876.
5.1	15.0	15.0	.0	110.	394.	33.2	218.5	34.6	7.0	1750.	59.9	.0	157.	17.0	69.9	.307	-87.	415.
10.2	15.0	15.0	.0	110.	788.	70.1	230.5	34.6	7.0	3499.	62.9	.0	210.	17.0	69.9	.001	-141.	829.
4.9	16.0	16.0	.0	110.	372.	34.5	217.6	33.0	7.0	1670.	59.7	.0	159.	17.0	69.9	.238	-89.	394.
9.7	16.0	16.0	.0	110.	745.	73.3	229.6	33.0	7.0	3339.	62.7	.0	214.	17.0	69.9	.000	-145.	788.
4.6	17.0	17.0	.0	110.	353.	35.9	216.7	29.0	7.0	1598.	59.5	.0	164.	17.0	69.9	.138	-94.	375.
9.3	17.0	17.0	.0	110.	705.	76.7	228.7	29.0	7.0	3195.	62.5	.0	221.	17.0	69.9	.000	-152.	750.
4.4	18.0	18.0	.0	110.	335.	37.5	215.9	26.0	7.0	1533.	59.4	.0	168.	17.0	69.9	.088	-98.	358.
8.8	18.0	18.0	.0	110.	669.	80.5	227.9	26.0	7.0	3065.	62.4	.0	227.	17.0	69.9	.000	-158.	715.
4.2	19.0	19.0	.0	110.	318.	39.2	215.1	24.0	7.0	1474.	59.2	.0	171.	17.0	69.9	.061	-101.	342.
8.4	19.0	19.0	.0	110.	636.	84.8	227.1	24.0	7.0	2948.	62.2	.0	232.	17.0	69.9	.000	-164.	684.
4.0	20.0	20.0	.0	110.	303.	41.0	214.4	21.0	7.0	1421.	59.0	.0	175.	17.0	69.9	.038	-105.	328.
8.1	20.0	20.0	.0	110.	605.	89.4	226.4	21.0	7.0	2841.	62.0	.0	240.	17.0	69.9	.000	-171.	655.
3.9	21.0	21.0	.0	110.	289.	43.1	213.7	20.0	7.0	1372.	58.9	.0	178.	17.0	69.9	.028	-108.	314.
7.8	21.0	21.0	.0	110.	577.	94.6	225.7	20.0	7.0	2744.	61.9	.0	245.	17.0	69.9	.000	-176.	629.
3.7	22.0	22.0	.0	110.	276.	45.3	213.0	19.0	7.0	1328.	58.7	.0	181.	17.0	69.9	.021	-111.	302.
7.5	22.0	22.0	.0	110.	551.	100.3	225.0	19.0	7.0	2656.	61.7	.0	251.	17.0	69.9	.000	-183.	604.
3.6	23.0	23.0	.0	110.	263.	47.7	212.3	18.0	7.0	1288.	58.6	.0	183.	17.0	69.9	.015	-114.	291.
7.2	23.0	23.0	.0	110.	527.	106.5	224.3	18.0	7.0	2576.	61.6	.0	258.	17.0	69.9	.000	-189.	582.
3.5	24.0	24.0	.0	110.	252.	50.4	211.7	16.0	7.0	1251.	58.5	.0	188.	17.0	69.9	.009	-118.	281.
6.9	24.0	24.0	.0	110.	504.	113.5	223.7	16.0	7.0	2503.	61.5	.0	266.	17.0	69.9	.000	-198.	561.
3.3	25.0	25.0	.0	110.	241.	53.3	211.1	16.0	7.0	1218.	58.4	.0	190.	17.0	69.9	.007	-120.	271.
6.7	25.0	25.0	.0	110.	483.	121.1	223.1	16.0	7.0	2436.	61.4	.0	274.	17.0	69.9	.000	-205.	542.

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3.2	26.0	26.0	.0	110.	232.	56.5	210.5	15.0	7.0	1188.	58.3	.0	194.	17.0	69.9	.005	-124.	262.	[redacted]
6.5	26.0	26.0	.0	110.	463.	129.6	222.5	15.0	7.0	2376.	61.3	.0	283.	17.0	69.9	.000	-214.	524.	
3.1	27.0	27.0	.0	110.	222.	59.9	209.9	13.8	7.0	1160.	58.2	.0	198.	17.0	69.9	.003	-128.	254.	
6.3	27.0	27.0	.0	110.	444.	138.9	221.9	13.8	7.0	2320.	61.2	.0	293.	17.0	69.9	.000	-224.	507.	
3.0	28.0	28.0	.0	110.	213.	63.7	209.4	9.0	7.0	1135.	58.1	.0	206.	17.0	69.9	.001	-136.	246.	
6.1	28.0	28.0	.0	110.	427.	149.2	221.4	9.0	7.0	2270.	61.1	.0	307.	17.0	69.9	.000	-238.	492.	
2.9	29.0	29.0	.0	110.	205.	67.8	208.9	8.0	7.0	1112.	58.0	.0	211.	17.0	69.9	.001	-141.	239.	
5.9	29.0	29.0	.0	110.	410.	160.7	220.9	8.0	7.0	2224.	61.0	.0	319.	17.0	69.9	.000	-250.	477.	
2.9	30.0	30.0	.0	110.	197.	72.3	208.4	4.0	7.0	1091.	57.9	.0	219.	17.0	69.9	.000	-149.	232.	
5.7	30.0	30.0	.0	110.	395.	173.3	220.4	4.0	7.0	2182.	60.9	.0	336.	17.0	69.9	.000	-267.	464.	

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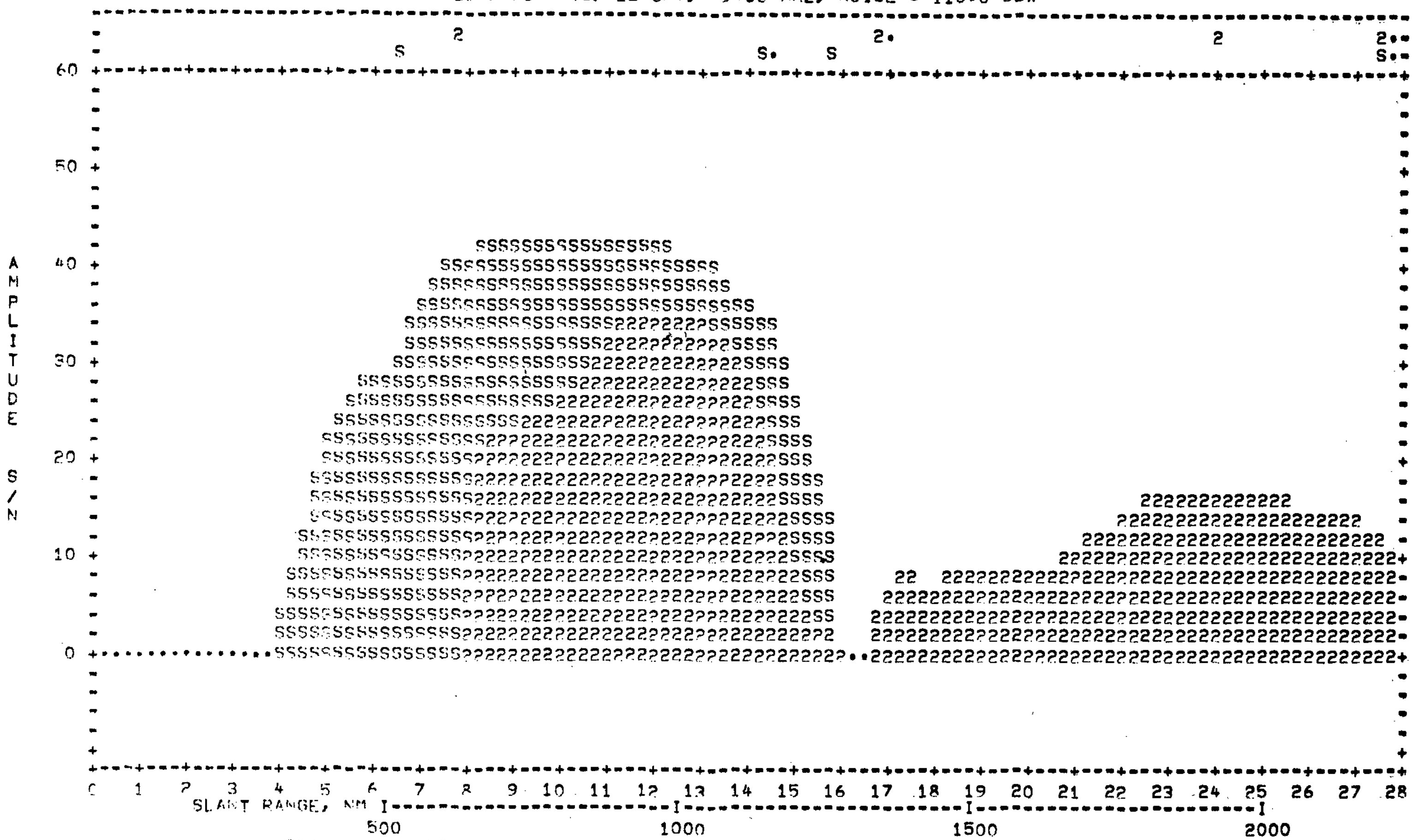
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 9.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	24.1	7.8	15.9	6.6
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	33.9	.0	10.8
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	32.1	.0	10.8
TILT	0000.0	0000.0	0000.0	0000.0	.1	.8	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	255.3	336.4	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	1885.5	503.2	1269.4	514.2

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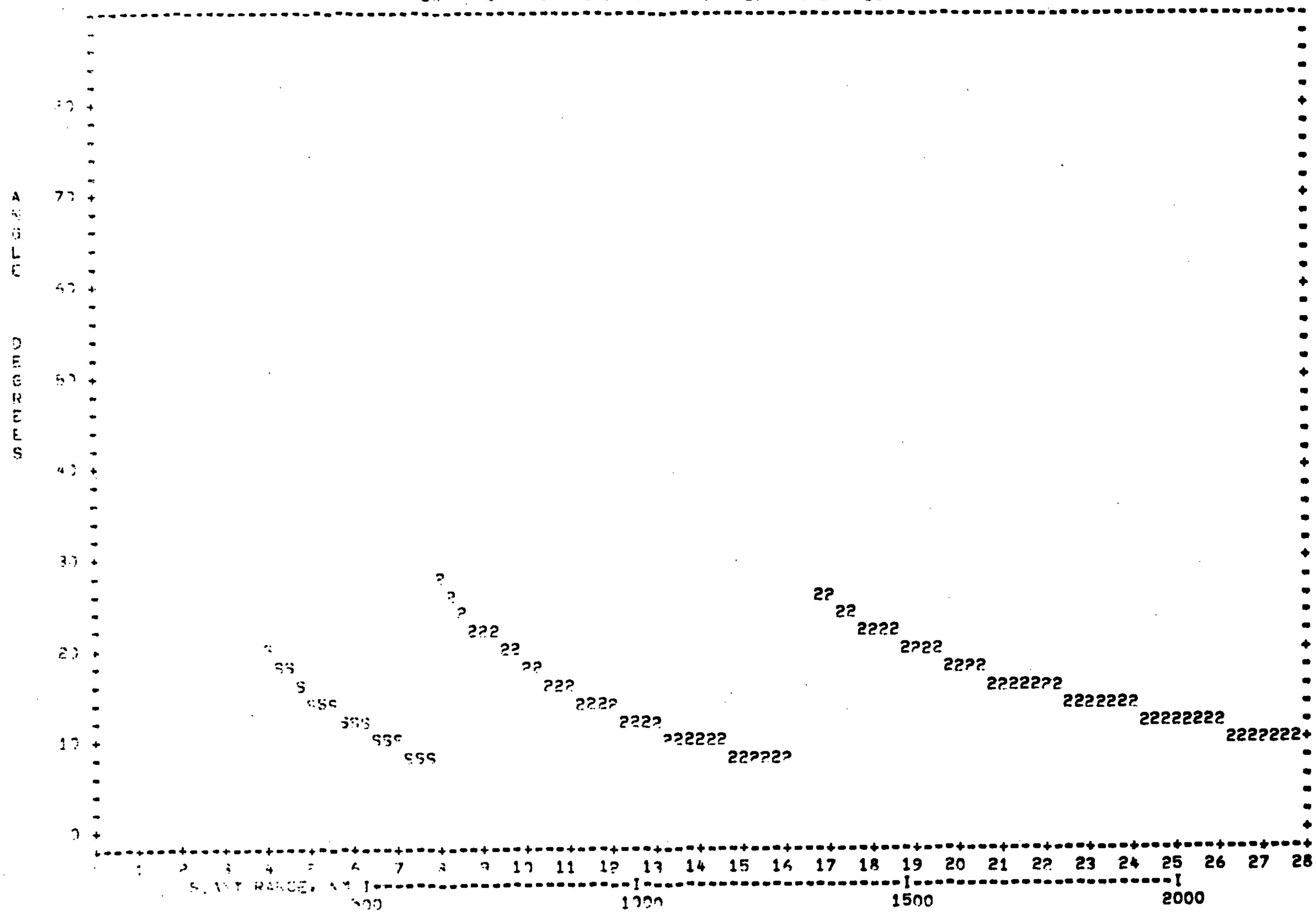
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 9.00 MHZ, NOISE = 110.0 DBW



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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 9.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
23.9	.0	.3	.1	255.	1885.	7.0	245.3	-31.0	7.0	7697.	66.4	48.4	265.	17.0	69.9	.000	-195.	1935.
22.7	1.7	.3	.2	255.	1791.	7.0	244.4	23.8	7.0	7349.	66.2	48.4	210.	17.0	69.9	.001	-140.	1841.
21.9	3.4	.3	.2	256.	1719.	6.8	243.7	30.0	7.0	7201.	66.1	48.4	203.	17.0	69.9	.002	-133.	1770.
18.3	5.1	4.4	.1	256.	1430.	6.4	240.6	37.4	7.0	6056.	65.3	48.4	193.	17.0	69.9	.005	-123.	1481.
16.7	6.8	6.1	.1	257.	1297.	5.9	239.0	42.4	7.0	5532.	64.9	48.4	186.	17.0	69.9	.011	-116.	1350.
15.2	8.5	7.8	.1	259.	1178.	5.5	237.4	45.0	7.0	5068.	64.6	40.6	174.	17.0	69.9	.044	-104.	1232.
14.1	10.2	9.3	.2	260.	1083.	5.1	236.0	47.0	7.0	4702.	64.2	15.0	145.	17.0	69.9	1.259	-75.	1139.
12.9	11.9	11.1	.2	261.	990.	4.7	234.6	48.8	7.0	4350.	63.9	9.6	136.	17.0	69.9	3.420	-66.	1048.
12.0	13.6	13.0	.2	264.	908.	4.3	233.2	49.0	7.0	4054.	63.6	9.1	134.	17.0	69.9	4.408	-64.	969.
11.1	15.3	15.1	.1	266.	834.	3.9	231.9	49.0	7.0	3788.	63.3	8.5	132.	17.0	69.9	5.514	-62.	897.
10.5	17.0	16.4	.2	269.	784.	3.7	231.0	48.6	7.0	3617.	63.1	8.0	131.	17.0	69.9	6.245	-61.	851.
10.0	18.7	17.7	.3	273.	741.	3.5	230.1	47.4	7.0	3470.	62.9	7.5	131.	17.0	69.9	6.368	-61.	811.
9.5	20.4	19.3	.4	276.	698.	3.3	229.3	46.8	7.0	3335.	62.7	7.1	130.	17.0	69.9	6.929	-60.	773.
9.1	22.1	21.0	.4	281.	658.	3.1	228.5	44.0	7.0	3219.	62.6	6.6	132.	17.0	69.9	5.806	-62.	737.
8.7	23.8	23.1	.3	286.	618.	2.9	227.7	41.0	7.0	3114.	62.4	6.3	133.	17.0	69.9	4.745	-63.	703.
8.4	25.5	24.7	.3	292.	590.	2.7	227.1	38.6	7.0	3053.	62.4	6.0	135.	17.0	69.9	4.019	-65.	681.
8.2	27.1	25.4	.7	297.	573.	2.6	226.8	33.4	7.0	3011.	62.3	5.7	139.	17.0	69.9	2.384	-69.	667.
8.0	28.8	27.0	.7	304.	550.	2.5	226.3	28.8	7.0	2980.	62.2	5.4	143.	17.0	69.9	1.532	-73.	651.
7.9	30.5	28.7	.8	312.	530.	2.4	226.0	20.4	7.0	2969.	62.2	5.2	151.	17.0	69.9	.628	-81.	639.
7.8	32.2	30.4	.8	322.	514.	2.3	225.8	17.0	7.0	2982.	62.3	5.0	154.	17.0	69.9	.451	-84.	631.
7.8	33.9	32.1	.8	336.	503.	2.2	225.8	11.0	7.0	3038.	62.3	4.8	159.	17.0	69.9	.235	-90.	631.
7.6	34.9	33.2	.8	336.	486.	2.1	225.4	10.0	7.0	3004.	62.3	4.8	160.	17.0	69.9	.139	-94.	617.
7.5	35.9	34.2	.8	336.	470.	2.1	225.0	8.0	7.0	2973.	62.2	4.7	162.	17.0	69.9	.097	-97.	604.
7.3	36.9	35.2	.8	336.	454.	2.0	224.6	7.4	7.0	2946.	62.2	4.6	162.	17.0	69.9	.078	-99.	591.
7.1	37.9	36.2	.8	336.	439.	2.0	224.3	7.0	7.0	2922.	62.2	4.5	162.	17.0	69.9	.062	-101.	579.
7.0	38.9	37.2	.8	336.	425.	1.9	223.9	6.2	7.0	2902.	62.1	4.5	162.	17.0	69.9	.046	-104.	567.
6.9	39.9	38.2	.8	336.	411.	1.9	223.6	5.4	7.0	2885.	62.1	4.4	162.	17.0	69.9	.033	-107.	556.
6.7	40.9	39.2	.8	336.	397.	1.9	223.3	3.4	7.0	2871.	62.1	4.4	164.	17.0	69.9	.020	-111.	546.
6.6	41.9	40.2	.8	336.	384.	1.8	222.9	2.6	7.0	2861.	62.1	4.4	164.	17.0	69.9	.014	-114.	536.
6.5	42.9	41.2	.8	336.	372.	1.8	222.6	.8	7.0	2853.	62.1	4.3	166.	17.0	69.9	.009	-118.	527.
6.4	43.9	42.2	.8	336.	359.	1.8	222.3	-10.0	7.0	2849.	62.1	4.3	176.	17.0	69.9	.002	-132.	518.

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F2-LAYER, 2-HOP

TIME	ELL1	ELL2	TILT	HITE	GCDIM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
37.4	4.4	4.0	.1	261.	1493.	6.4	12.7	.0	7.0	12368.	68.4	7.4	216.	17.0	69.9	.000	-146.	3028.
34.3	6.1	5.9	.1	262.	1346.	6.0	12.6	.0	7.0	11267.	68.0	6.9	208.	17.0	69.9	.001	-139.	2750.
31.1	7.6	7.4	.2	264.	1230.	5.6	12.7	.0	7.0	10347.	67.7	6.3	195.	17.0	69.9	.004	-125.	2518.
28.9	9.3	8.8	.2	265.	1140.	5.2	12.7	.0	7.0	9631.	67.3	5.8	165.	17.0	69.9	.118	-96.	2336.
26.8	11.1	10.8	.2	267.	1036.	4.8	12.7	.0	7.0	8888.	67.0	5.1	156.	17.0	69.9	.364	-86.	2142.
24.5	13.0	12.6	.3	270.	949.	4.4	12.7	.0	7.0	8266.	66.7	4.4	152.	17.0	69.9	.532	-82.	1980.
22.6	15.1	14.6	.3	275.	869.	4.0	12.7	.0	7.0	7717.	66.4	3.8	149.	17.0	69.9	.753	-79.	1833.
21.5	16.4	15.9	.4	277.	824.	3.7	12.7	.0	7.0	7388.	66.2	3.4	148.	17.0	69.9	.911	-78.	1744.
20.5	17.7	17.4	.2	280.	780.	3.5	12.7	.0	7.0	7102.	66.0	3.0	147.	17.0	69.9	.994	-77.	1663.
19.6	19.3	18.6	.4	284.	741.	3.3	12.8	.0	7.0	6837.	65.9	2.6	146.	17.0	69.9	1.152	-76.	1590.
18.8	21.0	21.3	.5	290.	702.	3.1	12.8	.0	7.0	6608.	65.7	2.2	147.	17.0	69.9	1.033	-77.	1521.
17.8	23.1	23.0	.1	298.	651.	2.9	12.7	.0	7.0	6387.	65.6	1.7	148.	17.0	69.9	.922	-78.	1443.
17.3	24.7	24.1	.5	304.	629.	2.7	12.8	.0	7.0	6263.	65.5	1.4	149.	17.0	69.9	.811	-79.	1403.
17.0	25.4	25.0	.4	308.	616.	2.7	12.9	.0	7.0	6204.	65.4	1.3	153.	17.0	69.9	.490	-83.	1380.
16.6	27.0	25.9	.1	316.	591.	2.5	12.9	.0	7.0	6149.	65.4	1.1	157.	17.0	69.9	.329	-87.	1346.
16.4	28.7	26.5	.2	329.	576.	2.4	13.0	.0	7.0	6154.	65.4	.9	164.	17.0	69.9	.139	-94.	1327.
16.5	30.4	29.2	1.5	342.	581.	2.4	13.3	.0	7.0	6161.	65.4	.7	167.	17.0	69.9	.099	-97.	1332.
16.1	32.1	30.3	1.5	343.	546.	2.3	12.8	.0	7.0	6149.	65.4	.6	177.	17.0	69.9	.031	-107.	1303.
15.7	33.2	31.3	1.5	343.	527.	2.2	12.8	.0	7.0	6071.	65.3	.5	184.	17.0	69.9	.015	-114.	1272.
15.4	34.2	32.4	1.5	343.	508.	2.1	12.8	.0	7.0	6000.	65.3	.4	189.	17.0	69.9	.008	-119.	1244.
15.0	35.2	33.4	1.5	343.	491.	2.1	12.8	.0	7.0	5937.	65.2	.4	193.	17.0	69.9	.005	-123.	1216.
14.7	36.2	34.4	1.5	343.	474.	2.0	12.8	.0	7.0	5881.	65.2	.3	198.	17.0	69.9	.003	-128.	1191.
14.4	37.2	35.4	1.5	343.	459.	2.0	12.8	.0	7.0	5832.	65.2	.3	203.	17.0	69.9	.002	-133.	1166.
14.1	38.2	36.4	1.5	343.	443.	2.0	12.8	.0	7.0	5790.	65.1	.3	209.	17.0	69.9	.001	-139.	1143.
13.8	39.2	37.5	1.5	343.	428.	1.9	12.8	.0	7.0	5755.	65.1	.2	216.	17.0	69.9	.000	-146.	1121.
13.6	40.2	38.5	1.5	343.	414.	1.9	12.8	.0	7.0	5726.	65.1	.2	223.	17.0	69.9	.000	-153.	1100.
13.3	41.2	39.5	1.5	343.	401.	1.8	12.7	.0	7.0	5704.	65.1	.2	231.	17.0	69.9	.000	-161.	1080.
13.1	42.2	40.5	1.5	343.	387.	1.8	12.7	.0	7.0	5688.	65.1	.1	248.	17.0	69.9	.000	-178.	1061.

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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 9.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	17.9	238.1	-31.0	7.0	5232.	64.7	.0	222.	17.0	69.9	.000	-152.	1284.
31.7	.0	.0	.0	110.	2539.	43.4	250.1	-31.0	7.0	10464.	67.7	.0	264.	17.0	69.9	.000	-194.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	236.5	13.0	7.0	4766.	64.3	.0	177.	17.0	69.9	.031	-107.	1169.
28.9	1.0	1.0	.0	110.	2310.	43.4	248.5	13.0	7.0	9533.	67.3	.0	218.	17.0	69.9	.000	-153.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	234.9	23.8	7.0	4347.	63.9	.0	165.	17.0	69.9	.123	-95.	1066.
26.3	2.0	2.0	.0	110.	2103.	43.5	246.9	23.8	7.0	8694.	66.9	.0	206.	17.0	69.9	.001	-141.	2132.
12.0	3.0	3.0	.0	110.	959.	17.9	233.3	30.0	7.0	3972.	63.5	.0	158.	17.0	69.9	.288	-88.	973.
24.1	3.0	3.0	.0	110.	1918.	43.8	245.3	30.0	7.0	7944.	66.5	.0	199.	17.0	69.9	.001	-134.	1947.
11.0	4.0	4.0	.0	110.	876.	17.9	231.8	34.0	7.0	3639.	63.1	.0	153.	17.0	69.9	.522	-83.	891.
22.0	4.0	4.0	.0	110.	1752.	44.1	243.8	34.0	7.0	7278.	66.1	.0	194.	17.0	69.9	.003	-128.	1782.
10.1	5.0	5.0	.0	110.	802.	17.9	230.3	37.4	7.0	3344.	62.7	.0	148.	17.0	69.9	.879	-78.	817.
20.2	5.0	5.0	.0	110.	1605.	44.5	242.3	37.4	7.0	6688.	65.7	.0	190.	17.0	69.9	.005	-124.	1635.
9.3	6.0	6.0	.0	110.	737.	17.9	228.8	41.0	7.0	3084.	62.4	.0	143.	17.0	69.9	1.507	-73.	753.
18.6	6.0	6.0	.0	110.	1474.	45.0	240.8	41.0	7.0	6167.	65.4	.0	186.	17.0	69.9	.008	-119.	1505.
8.6	7.0	7.0	.0	110.	679.	17.9	227.5	42.4	7.0	2854.	62.1	.0	141.	17.0	69.9	1.997	-71.	695.
17.2	7.0	7.0	.0	110.	1359.	45.7	239.5	42.4	7.0	5708.	65.1	.0	184.	17.0	69.9	.010	-117.	1390.
8.0	8.0	8.0	.0	110.	628.	17.9	226.1	45.0	7.0	2651.	61.7	.0	137.	17.0	69.9	3.022	-67.	644.
15.9	8.0	8.0	.0	110.	1256.	46.4	238.1	45.0	7.0	5302.	64.7	.0	182.	17.0	69.9	.014	-114.	1288.
7.4	9.0	9.0	.0	110.	583.	18.4	224.9	45.8	7.0	2472.	61.4	.0	136.	17.0	69.9	3.494	-66.	599.
14.8	9.0	9.0	.0	110.	1165.	47.7	236.9	45.8	7.0	4944.	64.4	.0	181.	17.0	69.9	.015	-113.	1198.
6.9	10.0	10.0	.0	110.	542.	21.3	223.7	47.0	7.0	2314.	61.1	.0	137.	17.0	69.9	3.184	-67.	559.
13.8	10.0	10.0	.0	110.	1084.	51.6	235.7	47.0	7.0	4628.	64.1	.0	183.	17.0	69.9	.013	-115.	1118.
6.5	11.0	11.0	.0	110.	506.	29.2	222.5	47.4	7.0	2174.	60.9	.0	143.	17.0	69.9	1.495	-74.	524.
12.9	11.0	11.0	.0	110.	1012.	60.5	234.5	47.4	7.0	4347.	63.9	.0	190.	17.0	69.9	.005	-123.	1047.
6.1	12.0	12.0	.0	110.	473.	30.0	221.4	48.8	7.0	2049.	60.6	.0	142.	17.0	69.9	1.749	-72.	492.
12.2	12.0	12.0	.0	110.	947.	62.5	233.4	48.8	7.0	4098.	63.6	.0	190.	17.0	69.9	.006	-122.	984.
5.7	13.0	13.0	.0	110.	444.	31.0	220.4	48.8	7.0	1938.	60.4	.0	142.	17.0	69.9	1.715	-72.	463.
11.4	13.0	13.0	.0	110.	888.	64.8	232.4	48.8	7.0	3876.	63.4	.0	192.	17.0	69.9	.005	-124.	927.
5.4	14.0	14.0	.0	110.	418.	32.1	219.4	49.0	7.0	1839.	60.2	.0	142.	17.0	69.9	1.694	-72.	438.
10.8	14.0	14.0	.0	110.	836.	67.3	231.4	49.0	7.0	3677.	63.2	.0	193.	17.0	69.9	.004	-125.	876.
5.1	15.0	15.0	.0	110.	394.	33.2	218.5	49.0	7.0	1750.	59.9	.0	143.	17.0	69.9	1.609	-73.	415.
10.2	15.0	15.0	.0	110.	788.	70.1	230.5	49.0	7.0	3499.	62.9	.0	195.	17.0	69.9	.003	-127.	829.
4.9	16.0	16.0	.0	110.	372.	34.5	217.6	48.8	7.0	1670.	59.7	.0	144.	17.0	69.9	1.468	-74.	394.
9.7	16.0	16.0	.0	110.	745.	73.3	229.6	48.8	7.0	3339.	62.7	.0	198.	17.0	69.9	.002	-130.	788.
4.6	17.0	17.0	.0	110.	353.	35.9	216.7	48.6	7.0	1598.	59.5	.0	145.	17.0	69.9	1.315	-75.	375.
9.3	17.0	17.0	.0	110.	705.	76.7	228.7	48.6	7.0	3195.	62.5	.0	201.	17.0	69.9	.002	-133.	750.
4.4	18.0	18.0	.0	110.	335.	37.5	215.9	48.0	7.0	1533.	59.4	.0	146.	17.0	69.9	1.105	-76.	358.
8.8	18.0	18.0	.0	110.	669.	80.5	227.9	48.0	7.0	3065.	62.4	.0	205.	17.0	69.9	.001	-136.	715.
4.2	19.0	19.0	.0	110.	318.	39.2	215.1	47.4	7.0	1474.	59.2	.0	148.	17.0	69.9	.910	-78.	342.
8.4	19.0	19.0	.0	110.	636.	84.8	227.1	47.4	7.0	2948.	62.2	.0	209.	17.0	69.9	.001	-140.	684.
4.0	20.0	20.0	.0	110.	303.	41.0	214.4	46.8	7.0	1421.	59.0	.0	150.	17.0	69.9	.733	-80.	328.
8.1	20.0	20.0	.0	110.	605.	89.4	226.4	46.8	7.0	2841.	62.0	.0	214.	17.0	69.9	.000	-145.	655.
3.9	21.0	21.0	.0	110.	289.	43.1	213.7	45.4	7.0	1372.	58.9	.0	152.	17.0	69.9	.527	-83.	314.
7.8	21.0	21.0	.0	110.	577.	94.6	225.7	45.4	7.0	2744.	61.9	.0	220.	17.0	69.9	.000	-151.	629.
3.7	22.0	22.0	.0	110.	276.	45.3	213.0	44.0	7.0	1328.	58.7	.0	156.	17.0	69.9	.370	-86.	302.
7.5	22.0	22.0	.0	110.	551.	100.3	225.0	44.0	7.0	2656.	61.7	.0	226.	17.0	69.9	.000	-158.	604.
3.6	23.0	23.0	.0	110.	263.	47.7	212.3	42.4	7.0	1288.	58.6	.0	159.	17.0	69.9	.247	-89.	291.
7.2	23.0	23.0	.0	110.	527.	106.5	224.3	42.4	7.0	2576.	61.6	.0	234.	17.0	69.9	.000	-165.	582.
3.5	24.0	24.0	.0	110.	252.	50.4	211.7	41.0	7.0	1251.	58.5	.0	163.	17.0	69.9	.164	-93.	281.
6.9	24.0	24.0	.0	110.	504.	113.5	223.7	41.0	7.0	2503.	61.5	.0	241.	17.0	69.9	.000	-173.	561.
3.3	25.0	25.0	.0	110.	241.	53.3	211.1	38.6	7.0	1218.	58.4	.0	167.	17.0	69.9	.094	-98.	271.
6.7	25.0	25.0	.0	110.	483.	121.1	223.1	38.6	7.0	2436.	61.4	.0	251.	17.0	69.9	.000	-182.	542.

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3.2	26.0	26.0	.0	110.	232.	56.5	210.5	36.6	7.0	1188.	58.3	.0	172.	17.0	69.9	.055	-102.	262.
6.5	26.0	26.0	.0	110.	463.	129.6	222.5	36.6	7.0	2376.	61.3	.0	261.	17.0	69.9	.000	-192.	524.
3.1	27.0	27.0	.0	110.	222.	59.9	209.9	33.4	7.0	1160.	58.2	.0	178.	17.0	69.9	.027	-108.	254.
6.3	27.0	27.0	.0	110.	444.	138.9	221.9	33.4	7.0	2320.	61.2	.0	273.	17.0	69.9	.000	-204.	507.
3.0	28.0	28.0	.0	110.	213.	63.7	209.4	30.8	7.0	1135.	58.1	.0	184.	17.0	69.9	.014	-114.	246.
6.1	28.0	28.0	.0	110.	427.	149.2	221.4	30.8	7.0	2270.	61.1	.0	286.	17.0	69.9	.000	-217.	492.
2.9	29.0	29.0	.0	110.	205.	67.8	208.9	28.8	7.0	1112.	58.0	.0	190.	17.0	69.9	.007	-120.	239.
5.9	29.0	29.0	.0	110.	410.	160.7	220.9	28.8	7.0	2224.	61.0	.0	299.	17.0	69.9	.000	-230.	477.
2.9	30.0	30.0	.0	110.	197.	72.3	208.4	24.6	7.0	1091.	57.9	.0	198.	17.0	69.9	.003	-128.	232.
5.7	30.0	30.0	.0	110.	395.	173.3	220.4	24.6	7.0	2182.	60.9	.0	315.	17.0	69.9	.000	-246.	464.

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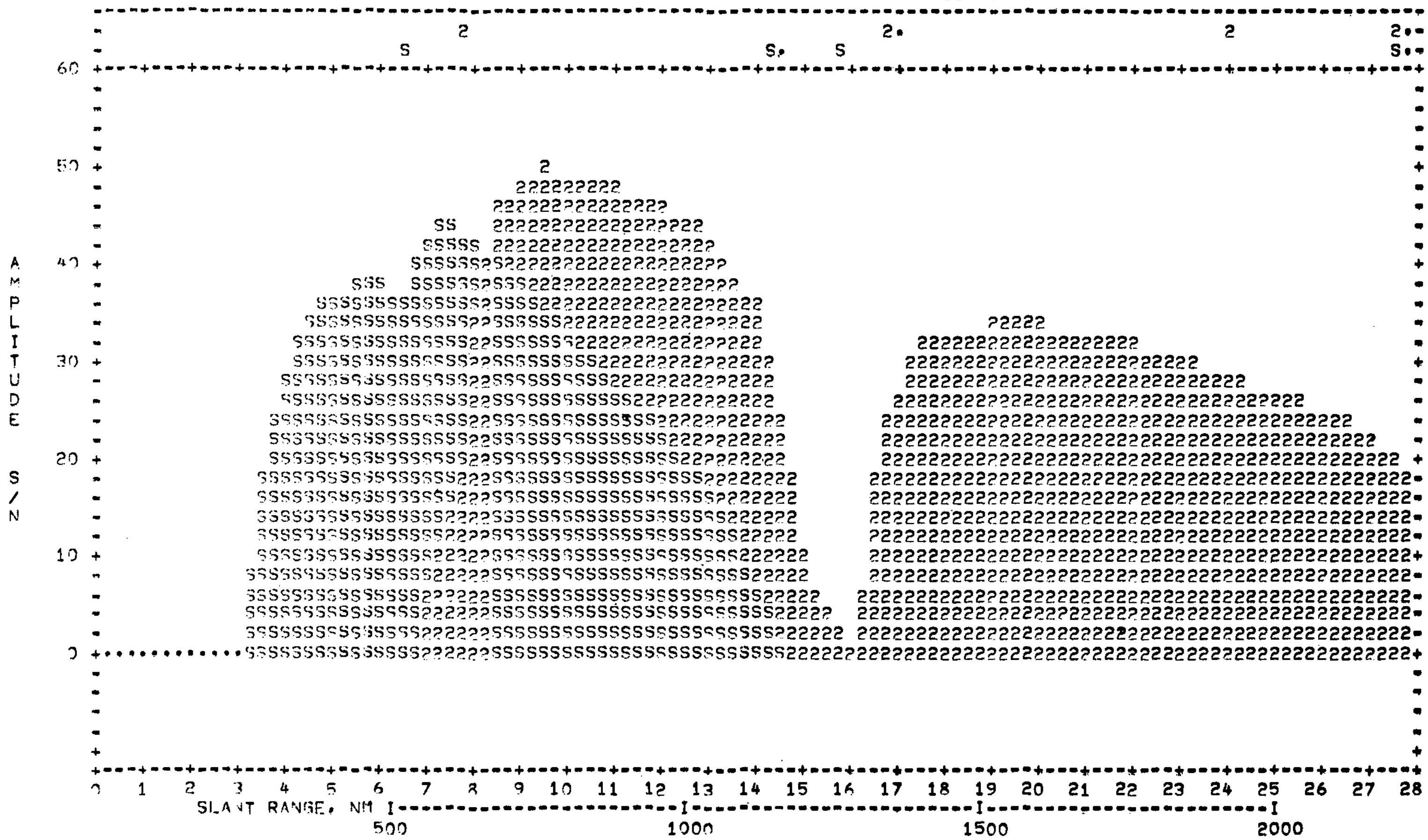
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT. = HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 9.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	24.1	7.8	15.9	6.6
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	33.9	.0	10.8
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	32.1	.0	10.8
TILT	0000.0	0000.0	0000.0	0000.0	.1	.8	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	255.3	336.4	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	2036.7	543.6	1371.3	555.4

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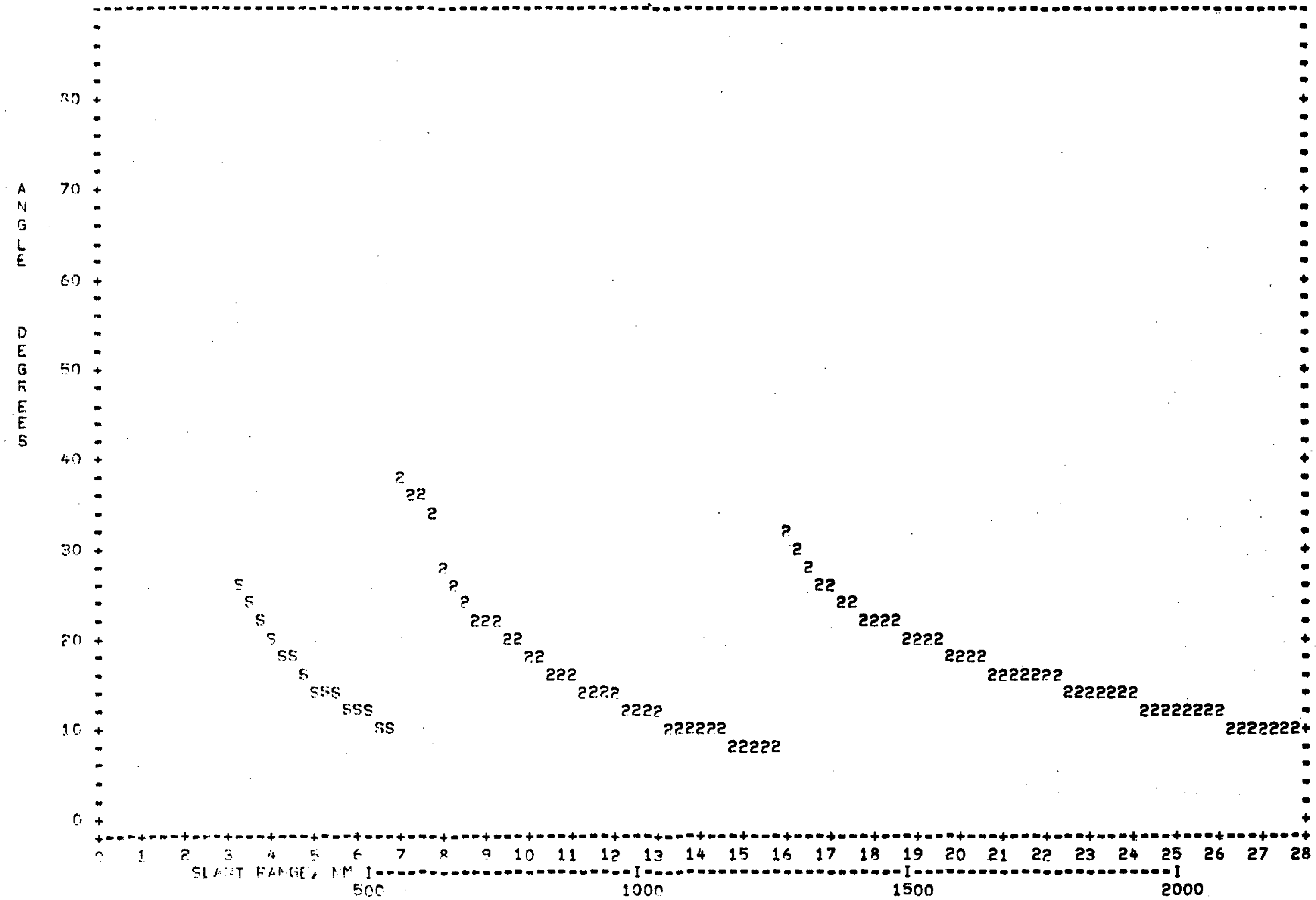
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 9.00 MHZ, NOISE = 110.0 DBW



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JU[illegible] SSN [illegible] 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 11.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNP	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
24.1	.0	.3	.2	261.	1899.	5.1	248.9	25.0	7.0	7587.	68.0	48.4	209.	17.0	69.9	.001	-139.	1950.
23.2	1.2	.3	.2	261.	1828.	5.1	248.2	44.6	7.0	7303.	67.9	48.4	189.	17.0	69.9	.008	-119.	1879.
22.5	2.5	.3	.3	262.	1767.	5.0	247.7	49.0	7.0	7116.	67.8	48.4	184.	17.0	69.9	.013	-114.	1818.
21.9	3.7	.3	.3	263.	1722.	4.9	247.2	49.4	7.0	7115.	67.8	34.7	170.	17.0	69.9	.073	-100.	1775.
19.6	4.9	2.9	.2	264.	1533.	4.7	245.3	42.8	7.0	6476.	67.4	21.0	155.	17.0	69.9	.399	-85.	1587.
18.0	6.1	4.7	.2	264.	1404.	4.5	243.8	47.6	7.0	5962.	67.0	10.6	144.	17.0	69.9	1.354	-74.	1458.
16.6	7.4	6.5	.2	266.	1287.	4.2	242.4	46.0	7.0	5507.	66.7	9.7	144.	17.0	69.9	1.465	-74.	1343.
15.6	8.6	7.8	.2	267.	1208.	4.0	241.3	41.4	7.0	5186.	66.4	9.3	147.	17.0	69.9	1.022	-77.	1261.
14.6	9.8	9.2	.2	269.	1125.	3.7	240.2	40.6	7.0	4885.	66.1	8.8	146.	17.0	69.9	1.109	-76.	1183.
14.0	11.1	9.8	.3	272.	1077.	3.6	239.5	40.6	7.0	4703.	66.0	8.4	145.	17.0	69.9	1.260	-75.	1137.
13.0	12.3	10.1	.1	275.	991.	3.3	238.2	39.8	7.0	4390.	65.7	8.0	144.	17.0	69.9	1.402	-74.	1054.
12.6	13.5	12.5	.3	278.	958.	3.1	237.6	37.4	7.0	4267.	65.5	7.6	145.	17.0	69.9	1.184	-76.	1022.
12.2	14.6	13.3	.4	281.	920.	3.0	237.0	34.6	7.0	4134.	65.4	7.2	147.	17.0	69.9	.961	-77.	987.
11.5	16.0	15.5	.2	285.	859.	2.8	236.0	33.0	7.0	3933.	65.2	6.9	147.	17.0	69.9	.939	-78.	930.
11.0	17.2	16.8	.1	289.	819.	2.6	235.3	29.0	7.0	3801.	65.0	6.5	150.	17.0	69.9	.668	-81.	893.
10.7	18.4	17.9	.2	293.	786.	2.5	234.7	26.0	7.0	3699.	64.9	6.2	153.	17.0	69.9	.524	-83.	863.
10.4	19.7	18.8	.3	299.	763.	2.4	234.3	21.0	7.0	3634.	64.9	5.9	157.	17.0	69.9	.320	-87.	844.
10.4	20.9	19.1	.7	305.	754.	2.3	234.2	20.0	7.0	3619.	64.8	5.7	157.	17.0	69.9	.298	-88.	839.
10.4	22.1	19.8	1.1	313.	751.	2.3	234.2	19.0	7.0	3626.	64.8	5.4	158.	17.0	69.9	.274	-88.	840.
10.2	23.4	21.7	1.0	323.	728.	2.2	233.9	18.0	7.0	3589.	64.8	5.2	159.	17.0	69.9	.262	-89.	824.
10.0	24.6	22.7	.7	337.	702.	2.1	233.6	14.0	7.0	3586.	64.8	5.1	160.	17.0	69.9	.222	-90.	812.
9.7	25.6	23.7	.7	337.	681.	2.0	233.1	15.0	7.0	3504.	64.7	4.9	160.	17.0	69.9	.122	-95.	787.
9.4	26.6	24.7	.7	337.	655.	1.9	232.6	13.8	7.0	3428.	64.6	4.8	161.	17.0	69.9	.084	-99.	764.
9.2	27.6	25.8	.7	337.	631.	1.9	232.1	9.0	7.0	3359.	64.5	4.7	165.	17.0	69.9	.035	-106.	742.
8.9	28.6	26.8	.7	337.	606.	1.8	231.6	8.0	7.0	3295.	64.4	4.6	166.	17.0	69.9	.021	-111.	722.
8.7	29.6	27.6	.7	337.	586.	1.8	231.1	4.0	7.0	3237.	64.4	4.5	169.	17.0	69.9	.008	-119.	703.
8.5	30.6	28.8	.7	337.	565.	1.7	230.7	-10.0	7.0	3184.	64.3	4.5	183.	17.0	69.9	.001	-137.	685.
8.2	31.6	29.8	.7	337.	546.	1.7	230.2	-10.0	7.0	3135.	64.2	4.4	182.	17.0	69.9	.001	-142.	667.
8.0	32.6	30.8	.7	337.	527.	1.6	229.8	-10.0	7.0	3091.	64.1	4.3	182.	17.0	69.9	.000	-148.	651.
7.9	33.6	31.9	.7	337.	509.	1.6	229.4	-10.0	7.0	3051.	64.1	4.3	181.	17.0	69.9	.000	-156.	636.
7.7	34.6	32.9	.7	337.	491.	1.5	229.0	-10.0	7.0	3016.	64.0	4.2	181.	17.0	69.9	.000	-171.	622.

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F2-LAYER, 2-HOP

TI[illegible]	[illegible]	[illegible]LP	TILT	HITE	GCDKM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
41.2	2.9	1.9	.2	269.	3232.	4.9	13.2	.0	7.0	13536.	70.6	6.1	176.	17.0	69.9	.036	-106.	3341.
37.7	4.7	3.6	-.3	271.	2940.	4.7	13.1	.0	7.0	12455.	70.2	5.7	165.	17.0	69.9	.132	-95.	3050.
34.[illegible]	6.5	[illegible].1	.1	273.	2646.	4.3	12.8	.0	7.0	11309.	69.8	5.2	163.	17.0	69.9	.163	-93.	2759.
32.1	7.6	7.3	.2	275.	2479.	4.0	12.8	.0	7.0	10658.	69.5	4.7	165.	17.0	69.9	.122	-95.	2594.
30.[illegible]	9.2	[illegible].6	-.3	278.	2312.	3.8	12.8	.0	7.0	10021.	69.3	4.3	164.	17.0	69.9	.145	-94.	2431.
2[illegible]	[illegible]	[illegible]	-.2	279.	2212.	3.6	12.7	.0	7.0	9652.	69.1	4.0	162.	17.0	69.9	.172	-92.	2334.
26.[illegible]	10.1	11.2	.5	285.	2040.	3.3	12.8	.0	7.0	9006.	68.8	3.3	160.	17.0	69.9	.215	-90.	2168.
25.[illegible]	12.5	12.3	-.1	286.	1968.	3.2	12.8	.0	7.0	8756.	68.7	3.1	161.	17.0	69.9	.189	-91.	2099.
25.3	13.3	12.7	.4	289.	1910.	3.1	12.9	.0	7.0	8545.	68.6	2.9	163.	17.0	69.9	.157	-93.	2046.
23.6	15.5	15.4	-.1	293.	1762.	2.8	12.7	.0	7.0	8060.	68.3	2.3	162.	17.0	69.9	.173	-92.	1907.
22.[illegible]	16.[illegible]	1[illegible].2	-.4	304.	1692.	2.7	12.9	.0	7.0	7824.	68.2	1.9	165.	17.0	69.9	.129	-95.	1844.
22.1	1[illegible]	17.[illegible]	.2	312.	1624.	2.5	12.9	.0	7.0	7640.	68.1	1.6	166.	17.0	69.9	.106	-96.	1785.
21.[illegible]	1[illegible]	[illegible].6	-.1	316.	1580.	2.4	12.9	.0	7.0	7513.	68.0	1.5	170.	17.0	69.9	.066	-101.	1747.
21.[illegible]	19.1	1[illegible].5	.4	313.	1574.	2.4	13.0	.0	7.0	7503.	68.0	1.4	171.	17.0	69.9	.062	-101.	1746.
21.[illegible]	19.2	1[illegible].3	.6	313.	1575.	2.4	13.0	.0	7.0	7515.	68.0	1.4	172.	17.0	69.9	.057	-102.	1751.
21.1	20.7	[illegible].1	.5	330.	1518.	2.3	12.9	.0	7.0	7412.	67.9	1.1	172.	17.0	69.9	.057	-102.	1708.
21.[illegible]	22.7	2[illegible].1	1.[illegible]	342.	1492.	2.2	13.1	.0	7.0	7365.	67.9	.8	178.	17.0	69.9	.029	-108.	1697.
20.3	23.7	21.2	1.[illegible]	342.	1433.	2.1	13.0	.0	7.0	7180.	67.8	.7	186.	17.0	69.9	.012	-116.	1642.
19.7	24.7	22.3	1.9	342.	1377.	2.0	13.0	.0	7.0	7009.	67.7	.6	192.	17.0	69.9	.005	-122.	1591.
19.1	25.[illegible]	23.4	1.[illegible]	342.	1324.	2.0	13.0	.0	7.0	6853.	67.6	.5	204.	17.0	69.9	.001	-134.	1544.
18.5	26.[illegible]	24.4	1.9	342.	1275.	1.9	13.0	.0	7.0	6710.	67.5	.4	213.	17.0	69.9	.000	-143.	1499.
18.[illegible]	27.[illegible]	25.5	1.9	342.	1228.	1.9	12.9	.0	7.0	6578.	67.4	.4	227.	17.0	69.9	.000	-157.	1457.
17.5	2[illegible]	2[illegible].5	1.[illegible]	342.	1183.	1.8	12.9	.0	7.0	6458.	67.3	.3	251.	17.0	69.9	.000	-182.	1418.
17.[illegible]	29.6	27.5	1.9	342.	1141.	1.7	12.9	.0	7.0	6348.	67.3	.2	264.	17.0	69.9	.000	-194.	1381.
16.6	30.[illegible]	2[illegible].6	1.9	342.	1100.	1.7	12.9	.0	7.0	6248.	67.2	.2	289.	17.0	69.9	.000	-220.	1346.
1[illegible].2	31.9	29.6	1.9	342.	1062.	1.7	12.9	.0	7.0	6157.	67.1	.2	297.	17.0	69.9	.000	-227.	1313.
15.[illegible]	32.9	30.7	1.9	342.	1025.	1.6	12.8	.0	7.0	6074.	67.1	.1	312.	17.0	69.9	.000	-242.	1282.

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JUN [illegible] 22 GMT   BEARING 65 DEG   PULSE = .12 MS   ANT.= VERT   TAR = 0 SQ KM   11.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	SCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	17.9	241.6	25.0	7.0	5232.	66.4	.0	168.	17.0	69.9	.087	-98.	1284.
31.7	.0	.0	.0	110.	2539.	45.1	253.6	25.0	7.0	10464.	69.4	.0	212.	17.0	69.9	.001	-142.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	240.0	44.6	7.0	4766.	66.0	.0	147.	17.0	69.9	.961	-77.	1169.
23.9	1.0	1.0	.0	110.	2310.	46.1	252.0	44.6	7.0	9533.	69.0	.0	191.	17.0	69.9	.004	-125.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	238.4	49.0	7.0	4347.	65.6	.0	142.	17.0	69.9	1.833	-72.	1066.
25.3	2.0	2.0	.0	110.	2103.	46.4	250.4	49.0	7.0	8694.	68.6	.0	186.	17.0	69.9	.006	-121.	2132.
12.0	3.0	3.0	.0	110.	959.	18.0	236.8	49.3	7.0	3972.	65.2	.0	140.	17.0	69.9	2.284	-70.	973.
24.1	3.0	3.0	.0	110.	1913.	46.8	248.8	49.8	7.0	7944.	68.2	.0	184.	17.0	69.9	.008	-119.	1947.
11.0	4.0	4.0	.0	110.	876.	13.4	235.2	49.4	7.0	3639.	64.9	.0	139.	17.0	69.9	2.375	-69.	891.
22.0	4.0	4.0	.0	110.	1752.	47.7	247.2	49.4	7.0	7278.	67.9	.0	184.	17.0	69.9	.008	-119.	1782.
10.1	5.0	5.0	.0	110.	802.	20.1	233.8	48.8	7.0	3344.	64.5	.0	141.	17.0	69.9	2.086	-71.	817.
20.2	5.0	5.0	.0	110.	1605.	50.0	245.8	48.8	7.0	6688.	67.5	.0	186.	17.0	69.9	.007	-120.	1635.
9.3	6.0	6.0	.0	110.	737.	26.0	232.3	47.6	7.0	3084.	64.1	.0	147.	17.0	69.9	1.034	-77.	753.
18.6	6.0	6.0	.0	110.	1474.	56.9	244.3	47.6	7.0	6167.	67.1	.0	193.	17.0	69.9	.003	-127.	1505.
8.6	7.0	7.0	.0	110.	679.	29.5	230.9	46.0	7.0	2854.	63.8	.0	151.	17.0	69.9	.648	-81.	695.
17.2	7.0	7.0	.0	110.	1359.	61.4	242.9	46.0	7.0	5708.	66.8	.0	198.	17.0	69.9	.002	-131.	1390.
8.0	8.0	8.0	.0	110.	628.	30.4	229.6	43.6	7.0	2651.	63.5	.0	153.	17.0	69.9	.499	-83.	644.
15.9	8.0	8.0	.0	110.	1256.	63.4	241.6	43.6	7.0	5302.	66.5	.0	202.	17.0	69.9	.001	-134.	1288.
7.4	9.0	9.0	.0	110.	583.	31.4	228.4	41.4	7.0	2472.	63.2	.0	155.	17.0	69.9	.385	-85.	599.
14.8	9.0	9.0	.0	110.	1165.	65.8	240.4	41.4	7.0	4944.	66.2	.0	205.	17.0	69.9	.001	-138.	1198.
6.9	10.0	10.0	.0	110.	542.	32.6	227.2	40.6	7.0	2314.	62.9	.0	156.	17.0	69.9	.342	-86.	559.
13.8	10.0	10.0	.0	110.	1084.	63.6	239.2	40.6	7.0	4628.	65.9	.0	208.	17.0	69.9	.001	-140.	1118.
6.5	11.0	11.0	.0	110.	506.	33.9	226.0	40.6	7.0	2174.	62.6	.0	157.	17.0	69.9	.324	-87.	524.
12.9	11.0	11.0	.0	110.	1012.	71.7	238.0	40.6	7.0	4347.	65.6	.0	210.	17.0	69.9	.001	-143.	1047.
6.1	12.0	12.0	.0	110.	473.	35.4	224.9	39.8	7.0	2049.	62.4	.0	158.	17.0	69.9	.274	-88.	492.
12.2	12.0	12.0	.0	110.	947.	75.4	236.9	39.8	7.0	4098.	65.4	.0	214.	17.0	69.9	.000	-146.	984.
5.7	13.0	13.0	.0	110.	444.	37.1	223.9	39.0	7.0	1938.	62.1	.0	160.	17.0	69.9	.226	-90.	463.
11.4	13.0	13.0	.0	110.	888.	79.5	235.9	39.0	7.0	3876.	65.1	.0	218.	17.0	69.9	.000	-150.	927.
5.4	14.0	14.0	.0	110.	418.	39.0	222.9	37.4	7.0	1839.	61.9	.0	163.	17.0	69.9	.165	-93.	438.
10.7	14.0	14.0	.0	110.	836.	84.2	234.9	37.4	7.0	3677.	64.9	.0	224.	17.0	69.9	.000	-155.	876.
5.1	15.0	15.0	.0	110.	394.	41.1	222.0	34.6	7.0	1750.	61.7	.0	167.	17.0	69.9	.101	-97.	415.
10.2	15.0	15.0	.0	110.	788.	89.6	234.0	34.6	7.0	3499.	64.7	.0	231.	17.0	69.9	.000	-163.	829.
4.9	16.0	16.0	.0	110.	372.	43.5	221.1	33.0	7.0	1670.	61.5	.0	170.	17.0	69.9	.069	-100.	394.
9.7	16.0	16.0	.0	110.	745.	95.6	233.1	33.0	7.0	3339.	64.5	.0	238.	17.0	69.9	.000	-170.	788.
4.6	17.0	17.0	.0	110.	353.	46.2	220.2	29.0	7.0	1598.	61.3	.0	176.	17.0	69.9	.035	-106.	375.
9.3	17.0	17.0	.0	110.	705.	102.5	232.2	29.0	7.0	3195.	64.3	.0	248.	17.0	69.9	.000	-180.	750.
4.4	18.0	18.0	.0	110.	335.	49.2	219.4	26.0	7.0	1533.	61.1	.0	182.	17.0	69.9	.019	-112.	358.
8.8	18.0	18.0	.0	110.	669.	110.4	231.4	26.0	7.0	3065.	64.1	.0	258.	17.0	69.9	.000	-190.	715.
4.2	19.0	19.0	.0	110.	318.	52.6	218.6	24.0	7.0	1474.	60.9	.0	186.	17.0	69.9	.011	-116.	342.
8.4	19.0	19.0	.0	110.	636.	119.3	230.6	24.0	7.0	2948.	63.9	.0	269.	17.0	69.9	.000	-200.	684.
4.0	20.0	20.0	.0	110.	303.	56.4	217.9	21.0	7.0	1421.	60.8	.0	193.	17.0	69.9	.005	-123.	328.
8.1	20.0	20.0	.0	110.	605.	129.4	229.9	21.0	7.0	2841.	63.8	.0	281.	17.0	69.9	.000	-213.	655.
3.9	21.0	21.0	.0	110.	289.	60.7	217.2	20.0	7.0	1372.	60.6	.0	197.	17.0	69.9	.003	-127.	314.
7.7	21.0	21.0	.0	110.	577.	141.0	229.2	20.0	7.0	2744.	63.6	.0	293.	17.0	69.9	.000	-225.	629.
3.7	22.0	22.0	.0	110.	276.	65.5	216.5	19.0	7.0	1328.	60.5	.0	202.	17.0	69.9	.002	-133.	302.
7.5	22.0	22.0	.0	110.	551.	154.2	228.5	19.0	7.0	2656.	63.5	.0	307.	17.0	69.9	.000	-238.	604.
3.6	23.0	23.0	.0	110.	263.	70.9	215.8	18.0	7.0	1288.	60.3	.0	208.	17.0	69.9	.001	-138.	291.
7.2	23.0	23.0	.0	110.	527.	169.2	227.8	18.0	7.0	2576.	63.3	.0	322.	17.0	69.9	.000	-254.	582.
3.5	24.0	24.0	.0	110.	252.	76.9	215.2	16.0	7.0	1251.	60.2	.0	216.	17.0	69.9	.000	-146.	281.
6.9	24.0	24.0	.0	110.	504.	186.5	227.2	16.0	7.0	2503.	63.2	.0	341.	17.0	69.9	.000	-272.	561.
3.3	25.0	25.0	.0	110.	241.	83.8	214.6	16.0	7.0	1218.	60.1	.0	222.	17.0	69.9	.000	-152.	271.
6.7	25.0	25.0	.0	110.	483.	206.2	226.6	16.0	7.0	2436.	63.1	.0	360.	17.0	69.9	.000	-292.	542.

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3.2	26.0	26.0	.0	110.	232.	91.5	214.0	15.0	7.0	1188.	60.0	.0	230.	17.0	69.9	.000	-161.	262.
6.5	26.0	26.0	.0	110.	463.	228.9	226.0	15.0	7.0	2376.	63.0	.0	384.	17.0	69.9	.000	-315.	524.
3.1	27.0	27.0	.0	110.	222.	100.2	213.4	13.8	7.0	1160.	59.9	.0	240.	17.0	69.9	.000	-170.	254.
6.3	27.0	27.0	.0	110.	444.	254.9	225.4	13.8	7.0	2320.	62.9	.0	410.	17.0	69.9	.000	-342.	507.
3.0	28.0	28.0	.0	110.	213.	110.0	212.9	9.0	7.0	1135.	59.8	.0	254.	17.0	69.9	.000	-184.	246.
6.1	28.0	28.0	.0	110.	427.	284.9	224.9	9.0	7.0	2270.	62.8	.0	445.	17.0	69.9	.000	-376.	492.
2.9	29.0	29.0	.0	110.	205.	121.1	212.4	8.0	7.0	1112.	59.7	.0	266.	17.0	69.9	.000	-196.	239.
5.9	29.0	29.0	.0	110.	410.	319.5	224.4	8.0	7.0	2224.	62.7	.0	480.	17.0	69.9	.000	-411.	477.
2.9	30.0	30.0	.0	110.	197.	133.6	211.9	4.0	7.0	1091.	59.6	.0	282.	17.0	69.9	.000	-212.	232.
5.7	30.0	30.0	.0	110.	395.	359.5	223.9	4.0	7.0	2182.	62.6	.0	523.	17.0	69.9	.000	-455.	464.

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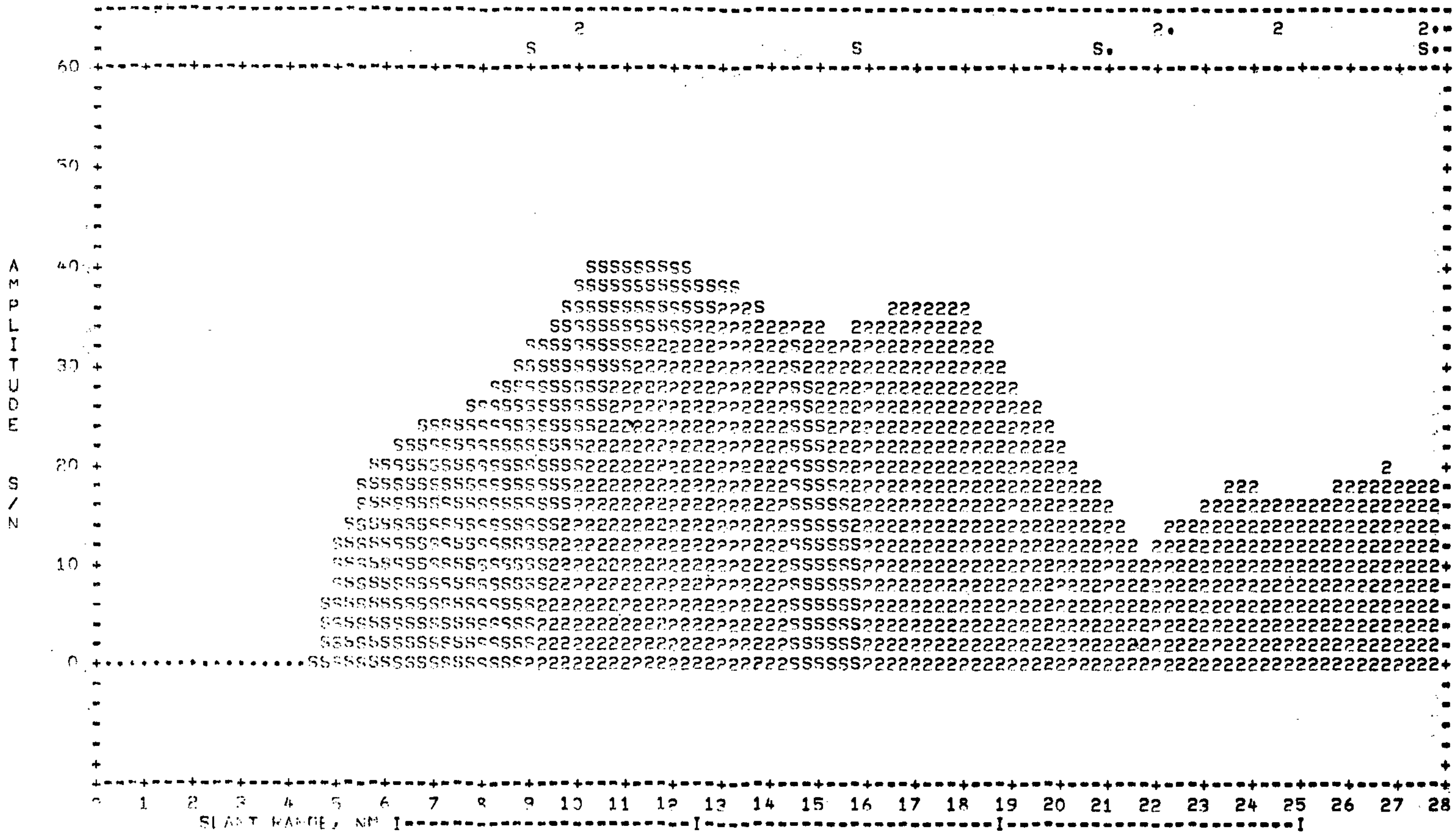
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 11.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	24.4	10.0	15.9	9.1
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	24.6	.0	6.2
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	22.7	.0	6.2
TILT	0000.0	0000.0	0000.0	0000.0	.2	.7	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	261.3	336.5	110.0	110.0
GROUND DISTANCE KM	0000.0	0000.0	0000.0	0000.0	1899.0	707.8	1269.4	722.9

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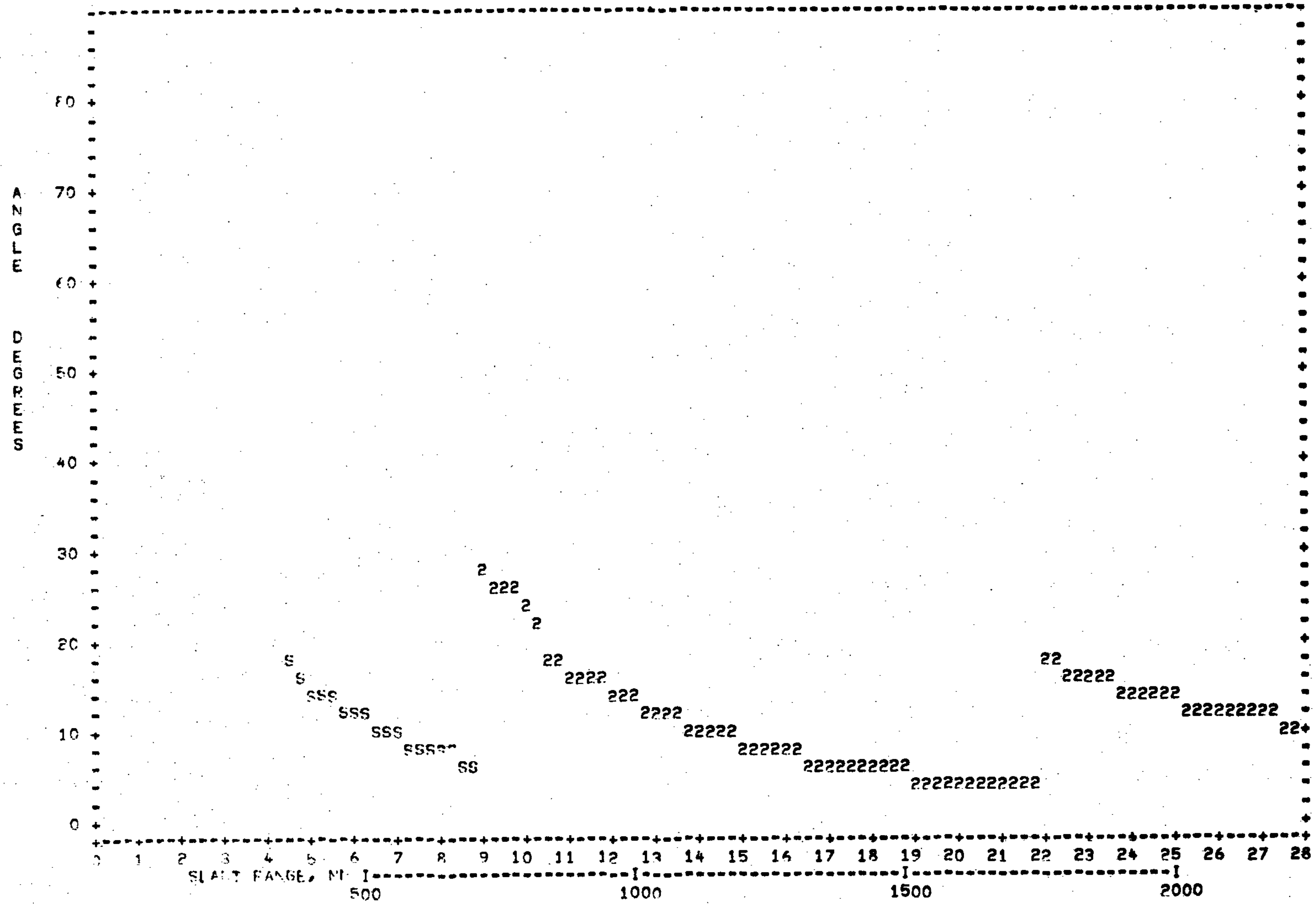
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 11.00 MHZ, NOISE = 110.0 DBW



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JU[illegible] 33[illegible] 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 11.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
24.1	.0	.3	.2	261.	1899.	5.1	248.9	-31.0	7.0	7587.	68.0	48.4	265.	17.0	69.9	.000	-195.	1950.
23.2	1.2	.3	.2	261.	1828.	5.1	248.2	13.0	7.0	7303.	67.9	48.4	221.	17.0	69.9	.000	-151.	1879.
22.5	2.5	.3	.3	262.	1767.	5.0	247.7	23.8	7.0	7116.	67.8	48.4	210.	17.0	69.9	.001	-140.	1818.
21.9	3.7	.3	.3	263.	1722.	4.9	247.2	34.0	7.0	7115.	67.8	34.7	185.	17.0	69.9	.012	-115.	1775.
19.6	4.9	2.9	.2	264.	1533.	4.7	245.3	37.4	7.0	6476.	67.4	21.0	166.	17.0	69.9	.107	-96.	1587.
18.0	6.1	4.7	.2	264.	1404.	4.5	243.8	41.0	7.0	5962.	67.0	10.6	151.	17.0	69.9	.633	-81.	1458.
16.6	7.4	6.5	.2	266.	1287.	4.2	242.4	42.4	7.0	5507.	66.7	9.7	147.	17.0	69.9	.968	-77.	1343.
15.6	8.6	7.8	.2	267.	1204.	4.0	241.3	45.8	7.0	5186.	66.4	9.3	142.	17.0	69.9	1.697	-72.	1261.
14.6	9.8	9.2	.2	269.	1125.	3.7	240.2	47.0	7.0	4885.	66.1	8.8	140.	17.0	69.9	2.317	-70.	1183.
14.0	11.1	9.8	.3	272.	1077.	3.6	239.5	47.4	7.0	4703.	66.0	8.4	138.	17.0	69.9	2.757	-68.	1137.
13.0	12.3	12.1	.1	275.	991.	3.3	238.2	48.8	7.0	4390.	65.7	8.0	135.	17.0	69.9	3.952	-65.	1054.
12.6	13.5	12.5	.3	278.	958.	3.1	237.6	49.0	7.0	4267.	65.5	7.6	134.	17.0	69.9	4.501	-64.	1022.
12.2	14.8	13.3	.4	281.	920.	3.0	237.0	49.0	7.0	4134.	65.4	7.2	133.	17.0	69.9	5.045	-63.	987.
11.5	16.0	15.5	.2	285.	859.	2.8	236.0	48.8	7.0	3933.	65.2	6.9	132.	17.0	69.9	5.787	-62.	930.
11.0	17.2	16.8	.1	289.	819.	2.6	235.3	48.6	7.0	3801.	65.0	6.5	131.	17.0	69.9	6.382	-61.	893.
10.7	18.4	18.0	.2	293.	786.	2.5	234.7	48.0	7.0	3699.	64.9	6.2	131.	17.0	69.9	6.603	-61.	863.
10.4	19.7	18.8	.3	299.	763.	2.4	234.3	46.8	7.0	3634.	64.9	5.9	131.	17.0	69.9	6.232	-61.	844.
10.4	20.9	19.1	.7	305.	754.	2.3	234.2	45.4	7.0	3619.	64.8	5.7	132.	17.0	69.9	5.551	-62.	839.
10.4	22.1	19.2	1.1	313.	751.	2.3	234.2	44.0	7.0	3626.	64.8	5.4	133.	17.0	69.9	4.874	-63.	840.
10.2	23.4	20.7	1.0	323.	728.	2.2	233.9	42.4	7.0	3589.	64.8	5.2	134.	17.0	69.9	4.356	-64.	824.
10.0	24.6	22.7	.7	337.	708.	2.1	233.6	38.6	7.0	3586.	64.8	5.1	137.	17.0	69.9	2.994	-67.	812.
9.7	25.6	23.7	.7	337.	681.	2.0	233.1	36.6	7.0	3504.	64.7	4.9	139.	17.0	69.9	1.469	-74.	787.
9.4	26.6	24.7	.7	337.	655.	1.9	232.6	33.4	7.0	3428.	64.6	4.8	141.	17.0	69.9	.798	-79.	764.
9.2	27.6	25.8	.7	337.	631.	1.9	232.1	30.8	7.0	3359.	64.5	4.7	143.	17.0	69.9	.430	-84.	742.
8.9	28.6	26.8	.7	337.	608.	1.8	231.6	28.8	7.0	3295.	64.4	4.6	145.	17.0	69.9	.230	-90.	722.
8.7	29.6	27.8	.7	337.	586.	1.8	231.1	24.6	7.0	3237.	64.4	4.5	148.	17.0	69.9	.090	-98.	703.
8.5	30.6	28.8	.7	337.	565.	1.7	230.7	20.4	7.0	3184.	64.3	4.5	152.	17.0	69.9	.033	-107.	685.
8.2	31.6	29.8	.7	337.	546.	1.7	230.2	17.0	7.0	3135.	64.2	4.4	155.	17.0	69.9	.012	-115.	667.
8.0	32.6	30.8	.7	337.	527.	1.6	229.8	14.6	7.0	3091.	64.1	4.3	157.	17.0	69.9	.005	-123.	651.
7.9	33.6	31.9	.7	337.	509.	1.6	229.4	11.0	7.0	3051.	64.1	4.3	160.	17.0	69.9	.001	-135.	636.
7.7	34.6	32.9	.7	337.	491.	1.5	229.0	10.0	7.0	3016.	64.0	4.2	161.	17.0	69.9	.000	-151.	622.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
41.3	2.9	1.9	.2	269.	1699.	4.9	13.2	.0	7.0	13536.	70.6	6.1	187.	17.0	69.9	.010	-117.	3341.
37.7	4.7	3.6	.3	271.	1536.	4.7	13.1	.0	7.0	12455.	70.2	5.7	171.	17.0	69.9	.062	-101.	3050.
34.1	6.5	5.1	.1	273.	1359.	4.3	12.8	.0	7.0	11309.	69.8	5.2	166.	17.0	69.9	.108	-96.	2759.
32.1	7.8	7.3	.2	275.	1275.	4.0	12.8	.0	7.0	10658.	69.5	4.7	161.	17.0	69.9	.203	-91.	2594.
30.0	9.2	8.6	.3	278.	1188.	3.8	12.8	.0	7.0	10021.	69.3	4.3	157.	17.0	69.9	.302	-87.	2431.
28.8	9.8	9.8	-.0	279.	1135.	3.6	12.7	.0	7.0	9652.	69.1	4.0	155.	17.0	69.9	.377	-85.	2334.
26.9	12.1	11.2	.5	285.	1049.	3.3	12.8	.0	7.0	9006.	68.8	3.3	151.	17.0	69.9	.607	-81.	2168.
25.9	12.5	12.3	.1	286.	1010.	3.2	12.8	.0	7.0	8756.	68.7	3.1	150.	17.0	69.9	.717	-80.	2099.
25.3	13.3	12.7	.4	289.	990.	3.1	12.9	.0	7.0	8545.	68.6	2.9	149.	17.0	69.9	.823	-79.	2046.
23.6	15.5	15.4	.1	298.	902.	2.8	12.7	.0	7.0	8060.	68.3	2.3	146.	17.0	69.9	1.070	-76.	1907.
22.8	16.8	16.2	.4	304.	873.	2.7	12.9	.0	7.0	7824.	68.2	1.9	145.	17.0	69.9	1.230	-75.	1844.
22.1	18.0	17.8	.2	312.	839.	2.5	12.9	.0	7.0	7640.	68.1	1.6	144.	17.0	69.9	1.334	-74.	1785.
21.6	18.8	18.6	.1	316.	817.	2.4	12.9	.0	7.0	7513.	68.0	1.5	145.	17.0	69.9	1.296	-75.	1747.
21.6	19.1	18.5	.4	318.	820.	2.4	13.0	.0	7.0	7503.	68.0	1.4	146.	17.0	69.9	1.150	-76.	1746.
21.6	19.2	18.3	.6	319.	824.	2.4	13.0	.0	7.0	7515.	68.0	1.4	147.	17.0	69.9	1.008	-77.	1751.
21.1	20.7	20.1	.5	330.	790.	2.3	12.9	.0	7.0	7412.	67.9	1.1	147.	17.0	69.9	.954	-77.	1708.
21.0	22.7	20.1	1.9	342.	784.	2.2	13.1	.0	7.0	7365.	67.9	.8	155.	17.0	69.9	.389	-85.	1697.
20.3	23.7	21.2	1.9	342.	752.	2.1	13.0	.0	7.0	7180.	67.8	.7	164.	17.0	69.9	.140	-94.	1642.
19.7	24.7	22.3	1.9	342.	722.	2.0	13.0	.0	7.0	7009.	67.7	.6	173.	17.0	69.9	.051	-103.	1591.
19.1	25.8	23.4	1.9	342.	693.	2.0	13.0	.0	7.0	6853.	67.6	.5	182.	17.0	69.9	.017	-112.	1544.
18.5	26.8	24.4	1.9	342.	667.	1.9	13.0	.0	7.0	6710.	67.5	.4	193.	17.0	69.9	.005	-123.	1499.
18.0	27.8	25.5	1.9	342.	641.	1.9	12.9	.0	7.0	6578.	67.4	.4	206.	17.0	69.9	.001	-136.	1457.
17.5	28.8	26.5	1.9	342.	618.	1.8	12.9	.0	7.0	6458.	67.3	.3	221.	17.0	69.9	.000	-151.	1418.
17.1	29.8	27.5	1.9	342.	595.	1.7	12.9	.0	7.0	6348.	67.3	.2	237.	17.0	69.9	.000	-167.	1381.
16.6	30.8	28.6	1.9	342.	574.	1.7	12.9	.0	7.0	6248.	67.2	.2	265.	17.0	69.9	.000	-195.	1346.
16.2	31.9	29.6	1.9	342.	553.	1.7	12.9	.0	7.0	6157.	67.1	.2	276.	17.0	69.9	.000	-206.	1313.
15.8	32.9	30.7	1.9	342.	534.	1.6	12.8	.0	7.0	6074.	67.1	.1	292.	17.0	69.9	.000	-222.	1282.

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3.2	26.0	26.0	.0	110.	232.	91.5	214.0	36.6	7.0	1188.	60.0	.0	209.	17.0	69.9	.001	-139.	262.
6.5	26.0	26.0	.0	110.	463.	228.9	226.0	36.6	7.0	2376.	63.0	.0	362.	17.0	69.9	.000	-293.	524.
3.1	27.0	27.0	.0	110.	222.	100.2	213.4	33.4	7.0	1160.	59.9	.0	220.	17.0	69.9	.000	-150.	254.
6.3	27.0	27.0	.0	110.	444.	254.9	225.4	33.4	7.0	2320.	62.9	.0	391.	17.0	69.9	.000	-322.	507.
3.0	28.0	28.0	.0	110.	213.	110.0	212.9	30.8	7.0	1135.	59.8	.0	232.	17.0	69.9	.000	-162.	246.
6.1	28.0	28.0	.0	110.	427.	284.9	224.9	30.8	7.0	2270.	62.8	.0	423.	17.0	69.9	.000	-354.	492.
2.9	29.0	29.0	.0	110.	205.	121.1	212.4	28.8	7.0	1112.	59.7	.0	245.	17.0	69.9	.000	-175.	239.
5.9	29.0	29.0	.0	110.	410.	319.5	224.4	28.8	7.0	2224.	62.7	.0	459.	17.0	69.9	.000	-390.	477.
2.9	30.0	30.0	.0	110.	197.	133.6	211.9	24.6	7.0	1091.	59.6	.0	261.	17.0	69.9	.000	-191.	232.
5.7	30.0	30.0	.0	110.	395.	359.5	223.9	24.6	7.0	2182.	62.6	.0	503.	17.0	69.9	.000	-434.	464.

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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 11.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	17.9	241.6	-31.0	7.0	5232.	66.4	.0	224.	17.0	69.9	.000	-154.	1284.
31.7	.0	.0	.0	110.	2539.	46.1	253.6	-31.0	7.0	10464.	69.4	.0	268.	17.0	69.9	.000	-198.	2568.
14.4	1.0	1.0	.0	110.	1155.	17.9	240.0	13.0	7.0	4766.	66.0	.0	179.	17.0	69.9	.025	-109.	1169.
28.9	1.0	1.0	.0	110.	2310.	46.1	252.0	13.0	7.0	9533.	69.0	.0	223.	17.0	69.9	.000	-157.	2339.
13.2	2.0	2.0	.0	110.	1052.	17.9	238.4	23.8	7.0	4347.	65.6	.0	167.	17.0	69.9	.101	-97.	1066.
26.3	2.0	2.0	.0	110.	2103.	46.4	250.4	23.8	7.0	8694.	68.6	.0	211.	17.0	69.9	.000	-146.	2132.
12.0	3.0	3.0	.0	110.	959.	18.0	236.8	30.0	7.0	3972.	65.2	.0	160.	17.0	69.9	.234	-90.	973.
24.1	3.0	3.0	.0	110.	1918.	46.8	248.8	30.0	7.0	7944.	68.2	.0	204.	17.0	69.9	.001	-139.	1947.
11.0	4.0	4.0	.0	110.	876.	18.4	235.2	34.0	7.0	3639.	64.9	.0	155.	17.0	69.9	.403	-85.	891.
22.0	4.0	4.0	.0	110.	1752.	47.7	247.2	34.0	7.0	7278.	67.9	.0	200.	17.0	69.9	.001	-134.	1782.
10.1	5.0	5.0	.0	110.	802.	20.1	233.8	37.4	7.0	3344.	64.5	.0	152.	17.0	69.9	.561	-82.	817.
20.2	5.0	5.0	.0	110.	1605.	50.0	245.8	37.4	7.0	6688.	67.5	.0	198.	17.0	69.9	.002	-131.	1635.
9.3	6.0	6.0	.0	110.	737.	26.0	232.3	41.0	7.0	3084.	64.1	.0	153.	17.0	69.9	.484	-83.	753.
18.6	6.0	6.0	.0	110.	1474.	56.9	244.3	41.0	7.0	6167.	67.1	.0	200.	17.0	69.9	.002	-133.	1505.
8.6	7.0	7.0	.0	110.	679.	29.5	230.9	42.4	7.0	2854.	63.8	.0	154.	17.0	69.9	.428	-84.	695.
17.2	7.0	7.0	.0	110.	1359.	61.4	242.9	42.4	7.0	5708.	66.8	.0	202.	17.0	69.9	.001	-135.	1390.
8.0	8.0	8.0	.0	110.	628.	30.4	229.6	45.0	7.0	2651.	63.5	.0	152.	17.0	69.9	.586	-82.	644.
15.9	8.0	8.0	.0	110.	1256.	63.4	241.6	45.0	7.0	5302.	66.5	.0	200.	17.0	69.9	.002	-133.	1288.
7.4	9.0	9.0	.0	110.	583.	31.4	228.4	45.8	7.0	2472.	63.2	.0	151.	17.0	69.9	.639	-81.	599.
14.8	9.0	9.0	.0	110.	1165.	65.8	240.4	45.8	7.0	4944.	66.2	.0	201.	17.0	69.9	.001	-133.	1198.
6.9	10.0	10.0	.0	110.	542.	32.6	227.2	47.0	7.0	2314.	62.9	.0	150.	17.0	69.9	.714	-80.	559.
13.8	10.0	10.0	.0	110.	1084.	68.6	239.2	47.0	7.0	4628.	65.9	.0	202.	17.0	69.9	.001	-134.	1118.
6.5	11.0	11.0	.0	110.	506.	33.9	226.0	47.4	7.0	2174.	62.6	.0	150.	17.0	69.9	.710	-80.	524.
12.9	11.0	11.0	.0	110.	1012.	71.7	238.0	47.4	7.0	4347.	65.6	.0	203.	17.0	69.9	.001	-136.	1047.
6.1	12.0	12.0	.0	110.	473.	35.4	224.9	48.8	7.0	2049.	62.4	.0	149.	17.0	69.9	.773	-79.	492.
12.2	12.0	12.0	.0	110.	947.	75.4	236.9	48.8	7.0	4098.	65.4	.0	205.	17.0	69.9	.001	-137.	984.
5.7	13.0	13.0	.0	110.	444.	37.1	223.9	48.8	7.0	1938.	62.1	.0	150.	17.0	69.9	.697	-80.	463.
11.4	13.0	13.0	.0	110.	888.	79.5	235.9	48.8	7.0	3876.	65.1	.0	208.	17.0	69.9	.001	-140.	927.
5.4	14.0	14.0	.0	110.	418.	39.0	222.9	49.0	7.0	1839.	61.9	.0	151.	17.0	69.9	.626	-81.	438.
10.8	14.0	14.0	.0	110.	836.	84.2	234.9	49.0	7.0	3677.	64.9	.0	212.	17.0	69.9	.000	-144.	876.
5.1	15.0	15.0	.0	110.	394.	41.1	222.0	49.0	7.0	1750.	61.7	.0	152.	17.0	69.9	.532	-82.	415.
10.2	15.0	15.0	.0	110.	788.	89.6	234.0	49.0	7.0	3499.	64.7	.0	217.	17.0	69.9	.000	-148.	829.
4.9	16.0	16.0	.0	110.	372.	43.5	221.1	48.8	7.0	1670.	61.5	.0	154.	17.0	69.9	.427	-84.	394.
9.7	16.0	16.0	.0	110.	745.	95.6	233.1	48.8	7.0	3339.	64.5	.0	222.	17.0	69.9	.000	-154.	788.
4.6	17.0	17.0	.0	110.	353.	46.2	220.2	48.6	7.0	1598.	61.3	.0	157.	17.0	69.9	.330	-87.	375.
9.3	17.0	17.0	.0	110.	705.	102.5	232.2	48.6	7.0	3195.	64.3	.0	229.	17.0	69.9	.000	-160.	750.
4.4	18.0	18.0	.0	110.	335.	49.2	219.4	48.0	7.0	1533.	61.1	.0	160.	17.0	69.9	.234	-90.	358.
8.8	18.0	18.0	.0	110.	669.	110.4	231.4	48.0	7.0	3065.	64.1	.0	236.	17.0	69.9	.000	-168.	715.
4.2	19.0	19.0	.0	110.	318.	52.6	218.6	47.4	7.0	1474.	60.9	.0	163.	17.0	69.9	.159	-93.	342.
8.4	19.0	19.0	.0	110.	636.	119.3	230.6	47.4	7.0	2948.	63.9	.0	245.	17.0	69.9	.000	-177.	684.
4.0	20.0	20.0	.0	110.	303.	56.4	217.9	46.8	7.0	1421.	60.8	.0	167.	17.0	69.9	.102	-97.	328.
8.1	20.0	20.0	.0	110.	605.	129.4	229.9	46.8	7.0	2841.	63.8	.0	255.	17.0	69.9	.000	-187.	655.
3.9	21.0	21.0	.0	110.	289.	60.7	217.2	45.4	7.0	1372.	60.6	.0	172.	17.0	69.9	.057	-102.	314.
7.8	21.0	21.0	.0	110.	577.	141.0	229.2	45.4	7.0	2744.	63.6	.0	268.	17.0	69.9	.000	-199.	629.
3.7	22.0	22.0	.0	110.	276.	65.5	216.5	44.0	7.0	1328.	60.5	.0	177.	17.0	69.9	.030	-108.	302.
7.5	22.0	22.0	.0	110.	551.	154.2	228.5	44.0	7.0	2656.	63.5	.0	282.	17.0	69.9	.000	-213.	604.
3.6	23.0	23.0	.0	110.	263.	70.9	215.8	42.4	7.0	1288.	60.3	.0	184.	17.0	69.9	.014	-114.	291.
7.2	23.0	23.0	.0	110.	527.	169.2	227.8	42.4	7.0	2576.	63.3	.0	298.	17.0	69.9	.000	-229.	582.
3.5	24.0	24.0	.0	110.	252.	76.9	215.2	41.0	7.0	1251.	60.2	.0	191.	17.0	69.9	.006	-121.	281.
6.9	24.0	24.0	.0	110.	504.	186.5	227.2	41.0	7.0	2503.	63.2	.0	316.	17.0	69.9	.000	-247.	561.
3.3	25.0	25.0	.0	110.	241.	83.8	214.6	38.6	7.0	1218.	60.1	.0	200.	17.0	69.9	.002	-130.	271.
6.7	25.0	25.0	.0	110.	483.	206.2	226.6	38.6	7.0	2436.	63.1	.0	338.	17.0	69.9	.000	-269.	542.

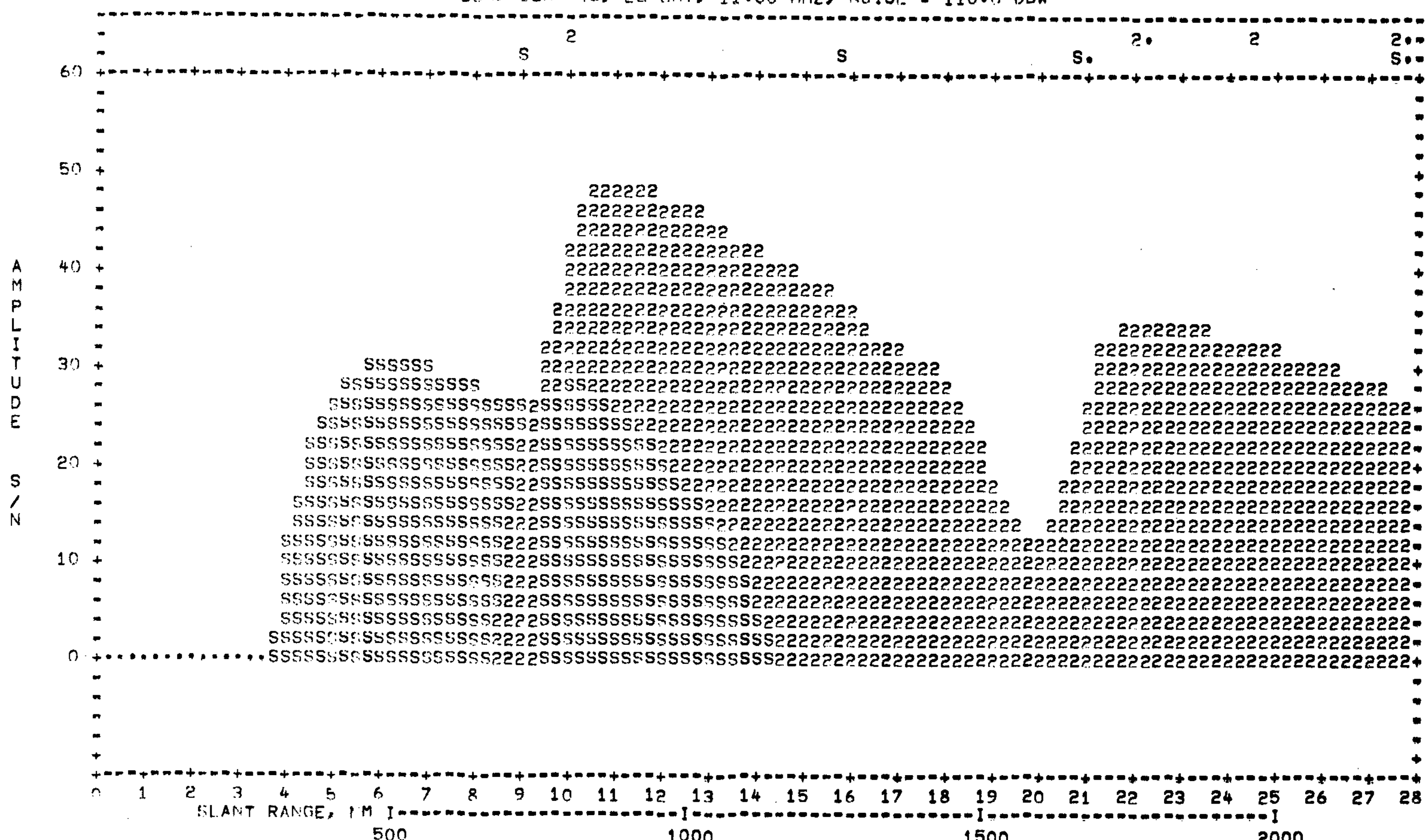
[redacted]

RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 11.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	24.4	10.0	15.9	9.1
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	24.6	.0	6.2
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	22.7	.0	6.2
TILT	0000.0	0000.0	0000.0	0000.0	.2	.7	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	261.3	336.5	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	2051.4	764.6	1371.3	780.9

UNCLASSIFIED

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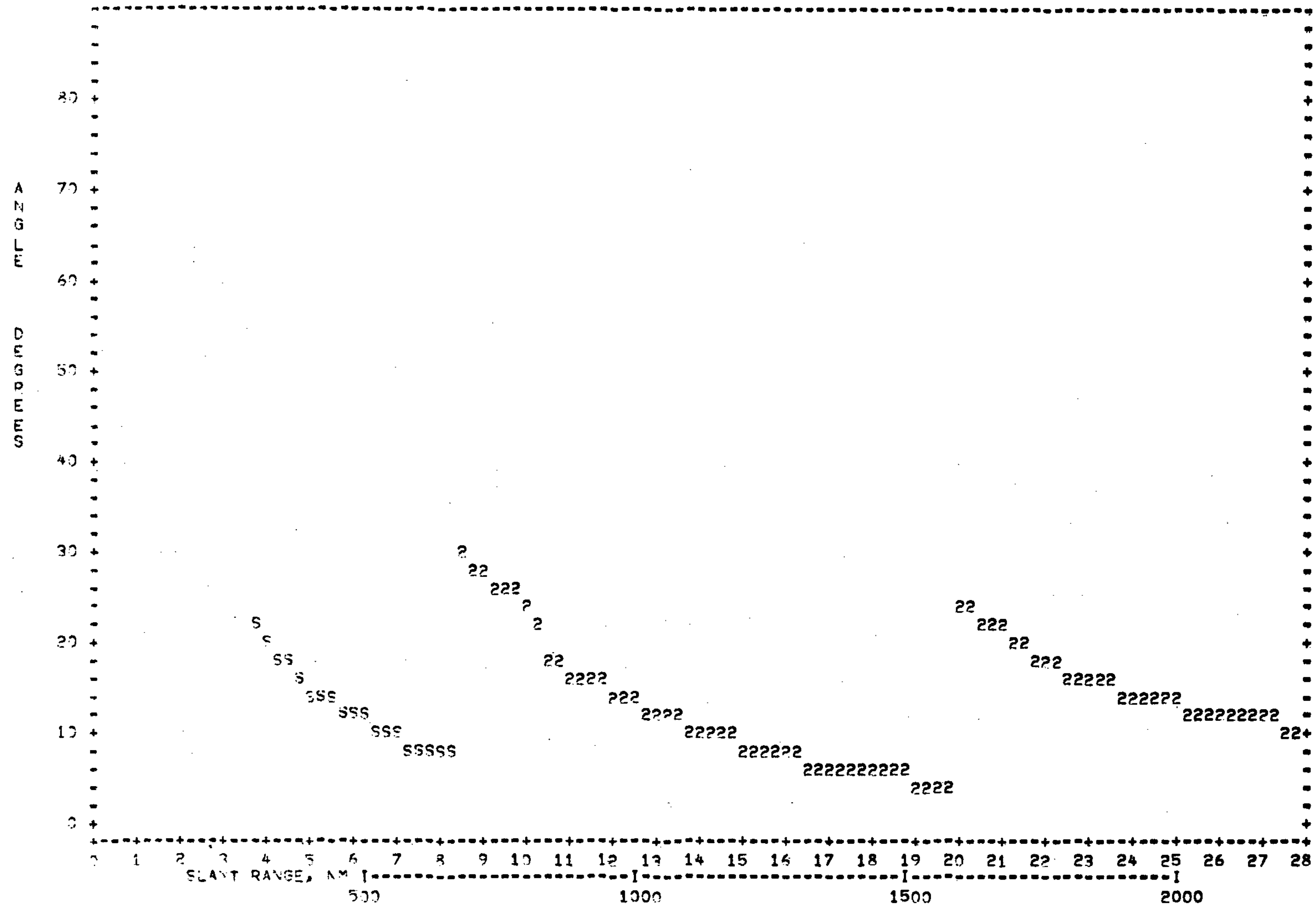
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 11.00 MHZ, NOISE = 110.0 DBW



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JJ. SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 14.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
24.7	.0	.3	.3	278.	1946.	3.4	253.5	25.0	7.0	7455.	70.1	9.3	171.	17.0	69.9	.062	-101.	2001.
24.2	.7	.3	.3	273.	1906.	3.4	253.2	44.6	7.0	7377.	70.0	9.3	151.	17.0	69.9	.611	-81.	1961.
23.9	1.5	.3	.2	273.	1876.	3.3	252.9	44.6	7.0	7478.	70.1	9.2	151.	17.0	69.9	.639	-81.	1932.
23.6	2.2	.3	.1	278.	1854.	3.3	252.7	49.0	7.0	7741.	70.2	9.1	146.	17.0	69.9	1.115	-76.	1912.
22.5	3.0	1.3	.1	279.	1763.	3.3	251.9	49.8	7.0	7423.	70.0	9.0	144.	17.0	69.9	1.345	-74.	1821.
22.7	3.7	.3	.3	280.	1780.	3.3	252.0	49.4	7.0	7292.	70.0	8.9	145.	17.0	69.9	1.275	-75.	1837.
22.0	4.5	.3	.6	281.	1727.	3.2	251.5	49.4	7.0	6673.	69.6	8.7	144.	17.0	69.9	1.327	-75.	1783.
20.9	5.2	2.0	.3	283.	1634.	3.1	250.6	48.8	7.0	6904.	69.7	8.5	144.	17.0	69.9	1.441	-74.	1693.
18.8	6.0	5.1	.1	284.	1458.	3.0	248.7	47.6	7.0	6213.	69.3	8.3	143.	17.0	69.9	1.551	-73.	1518.
18.5	6.7	5.0	.3	286.	1437.	2.9	248.5	46.0	7.0	6127.	69.2	8.1	144.	17.0	69.9	1.357	-74.	1498.
17.4	7.4	6.7	.1	287.	1346.	2.8	247.4	46.0	7.0	5779.	69.0	7.8	143.	17.0	69.9	1.557	-73.	1409.
16.9	8.2	7.3	.2	291.	1308.	2.7	246.9	43.6	7.0	5635.	68.9	7.6	145.	17.0	69.9	1.277	-75.	1372.
16.5	8.9	7.7	.3	292.	1271.	2.6	246.5	41.4	7.0	5491.	68.7	7.4	146.	17.0	69.9	1.070	-76.	1335.
16.5	9.7	7.4	.5	295.	1267.	2.6	246.5	40.6	7.0	5479.	68.7	7.1	147.	17.0	69.9	1.008	-77.	1333.
15.8	10.4	8.6	.4	298.	1211.	2.5	245.7	40.6	7.0	5270.	68.6	6.9	146.	17.0	69.9	1.119	-76.	1279.
15.6	11.2	8.8	.5	303.	1196.	2.4	245.5	40.6	7.0	5218.	68.5	6.7	145.	17.0	69.9	1.175	-76.	1265.
15.0	11.9	10.2	.4	306.	1140.	2.3	244.8	39.8	7.0	5016.	68.3	6.4	145.	17.0	69.9	1.193	-75.	1211.
15.5	12.7	8.9	1.0	313.	1181.	2.3	245.4	39.0	7.0	5176.	68.5	6.2	146.	17.0	69.9	1.050	-77.	1255.
14.4	13.4	11.8	.4	318.	1085.	2.1	244.1	39.0	7.0	4842.	68.2	6.0	145.	17.0	69.9	1.239	-75.	1163.
15.5	14.1	8.9	1.4	325.	1174.	2.3	245.4	37.4	7.0	5167.	68.5	5.8	148.	17.0	69.9	.924	-78.	1252.
14.4	14.9	12.6	.7	337.	1077.	2.0	244.1	34.6	7.0	4854.	68.2	5.7	149.	17.0	69.9	.790	-79.	1162.
13.7	15.9	13.7	.7	337.	1026.	1.9	243.3	33.0	7.0	4668.	68.0	5.4	150.	17.0	69.9	.369	-86.	1113.
13.2	16.9	14.8	.7	337.	979.	1.8	242.5	29.0	7.0	4499.	67.9	5.2	153.	17.0	69.9	.153	-93.	1067.
12.7	17.9	15.9	.7	337.	935.	1.8	241.9	26.0	7.0	4343.	67.7	5.1	155.	17.0	69.9	.060	-101.	1025.
12.2	18.9	16.9	.7	337.	894.	1.7	241.2	24.0	7.0	4201.	67.6	4.9	156.	17.0	69.9	.022	-110.	986.
11.7	19.9	18.0	.7	337.	856.	1.6	240.6	21.0	7.0	4070.	67.4	4.7	158.	17.0	69.9	.006	-122.	950.
11.3	20.9	19.0	.7	337.	820.	1.6	239.9	20.0	7.0	3950.	67.3	4.6	159.	17.0	69.9	.001	-135.	916.
10.9	21.9	20.1	.7	337.	787.	1.5	239.3	19.0	7.0	3840.	67.2	4.5	159.	17.0	69.9	.000	-149.	885.
10.6	22.9	21.1	.7	337.	755.	1.4	238.8	18.0	7.0	3738.	67.1	4.4	160.	17.0	69.9	.000	-150.	856.
10.2	23.9	22.1	.7	337.	726.	1.4	238.2	16.0	7.0	3644.	67.0	4.4	161.	17.0	69.9	.000	-151.	828.
9.9	24.9	23.2	.7	337.	698.	1.3	237.6	16.0	7.0	3558.	66.9	4.3	160.	17.0	69.9	.000	-151.	803.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	SCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	RBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
47.2	1.3	.5	.3	292.	2704.	3.3	13.2	.0	7.0	14442.	72.9	4.4	162.	17.0	69.9	.169	-92.	3823.
45.3	2.0	.3	.3	292.	2542.	3.3	13.7	.0	7.0	13981.	72.8	4.4	162.	17.0	69.9	.175	-92.	3663.
38.5	5.1	.4	.1	293.	3022.	3.0	12.9	.0	7.0	12868.	72.4	3.7	160.	17.0	69.9	.232	-90.	3148.
33.6	5.0	4.7	.1	293.	2996.	3.0	13.0	.0	7.0	12768.	72.4	3.8	161.	17.0	69.9	.201	-91.	3122.
36.2	4.7	5.7	.2	303.	2812.	2.9	13.1	.0	7.0	12046.	72.2	3.3	159.	17.0	69.9	.247	-89.	2942.
36.4	7.3	4.3	.2	306.	2517.	2.9	13.6	.0	7.0	11234.	71.8	3.1	161.	17.0	69.9	.190	-91.	2949.
34.1	7.7	4.3	.2	307.	2684.	2.8	13.2	.0	7.0	11549.	72.0	3.0	162.	17.0	69.9	.175	-92.	2817.
35.5	7.4	5.0	.2	306.	2743.	2.8	13.6	.0	7.0	11528.	72.0	3.0	163.	17.0	69.9	.154	-93.	2876.
33.3	9.6	7.7	.4	313.	2554.	2.6	13.2	.0	7.0	11074.	71.8	2.7	161.	17.0	69.9	.193	-91.	2693.
32.9	9.4	7.9	.4	313.	2522.	2.6	13.2	.0	7.0	10956.	71.7	2.6	161.	17.0	69.9	.205	-91.	2663.
31.6	10.2	9.2	.5	323.	2407.	2.4	13.2	.0	7.0	10548.	71.6	2.2	160.	17.0	69.9	.221	-90.	2555.
32.7	9.9	4.0	.4	313.	2504.	2.6	13.2	.0	7.0	10901.	71.7	2.6	162.	17.0	69.9	.183	-92.	2649.
31.5	11.2	7.6	1.0	342.	2414.	2.4	14.1	.0	7.0	9758.	71.2	1.8	163.	17.0	69.9	.159	-93.	2574.
32.4	8.5	.2	.3	313.	2488.	2.6	13.2	.0	7.0	10861.	71.7	2.6	163.	17.0	69.9	.162	-93.	2638.
31.1	12.6	2.6	1.0	342.	2348.	2.3	13.7	.0	7.0	10267.	71.5	1.6	168.	17.0	69.9	.091	-98.	2516.
29.5	13.7	10.0	1.0	342.	2220.	2.2	13.6	.0	7.0	9897.	71.3	1.3	178.	17.0	69.9	.028	-108.	2391.
28.2	14.3	11.4	1.0	342.	2105.	2.1	13.5	.0	7.0	9478.	71.1	1.1	191.	17.0	69.9	.006	-121.	2280.
26.9	15.4	12.6	1.0	342.	2002.	2.0	13.4	.0	7.0	9103.	70.9	.9	206.	17.0	69.9	.001	-136.	2180.
25.8	16.5	13.6	1.0	342.	1907.	1.9	13.3	.0	7.0	8766.	70.8	.7	224.	17.0	69.9	.000	-154.	2089.
24.8	18.0	15.0	1.0	342.	1819.	1.8	13.2	.0	7.0	8460.	70.6	.6	247.	17.0	69.9	.000	-177.	2005.
23.8	19.0	16.2	1.0	342.	1739.	1.7	13.2	.0	7.0	8182.	70.5	.5	278.	17.0	69.9	.000	-208.	1928.
22.9	20.1	17.3	1.0	342.	1664.	1.6	13.1	.0	7.0	7928.	70.3	.4	291.	17.0	69.9	.000	-221.	1857.
22.1	21.1	17.4	1.0	342.	1594.	1.6	13.1	.0	7.0	7696.	70.2	.3	291.	17.0	69.9	.000	-221.	1792.
21.4	22.1	17.5	1.0	342.	1528.	1.5	13.1	.0	7.0	7483.	70.1	.2	293.	17.0	69.9	.000	-223.	1731.
20.7	23.2	2[illegible].6	1.0	342.	1467.	1.4	13.0	.0	7.0	7288.	70.0	.2	292.	17.0	69.9	.000	-222.	1674.

[redacted]

JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VEPT TAR = 0 SQ KM 14.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDKM	ABS	FREE	ANT	BEAM	AREA	BACK	BRF	LOSS	IMP	PWR	VBLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	30.8	245.8	25.0	7.0	5232.	68.5	.0	183.	17.0	69.9	.015	-113.	1284.
31.7	.0	.0	.0	110.	2539.	64.4	257.8	25.0	7.0	10464.	71.5	.0	232.	17.0	69.9	.000	-163.	2568.
14.4	1.0	1.0	.0	110.	1155.	30.9	244.2	44.6	7.0	4766.	68.1	.0	162.	17.0	69.9	.168	-92.	1169.
28.9	1.0	1.0	.0	110.	2310.	64.7	256.2	44.6	7.0	9533.	71.1	.0	212.	17.0	69.9	.000	-146.	2339.
13.2	2.0	2.0	.0	110.	1052.	31.2	242.6	49.0	7.0	4347.	67.7	.0	157.	17.0	69.9	.310	-87.	1066.
26.3	2.0	2.0	.0	110.	2103.	65.4	254.6	49.0	7.0	8694.	70.7	.0	207.	17.0	69.9	.001	-142.	2132.
12.0	3.0	3.0	.0	110.	959.	31.7	241.0	49.8	7.0	3972.	67.3	.0	156.	17.0	69.9	.369	-86.	973.
24.1	3.0	3.0	.0	110.	1918.	66.5	253.0	49.8	7.0	7944.	70.3	.0	206.	17.0	69.9	.001	-141.	1947.
11.0	4.0	4.0	.0	110.	876.	32.4	239.4	49.4	7.0	3639.	67.0	.0	156.	17.0	69.9	.371	-86.	891.
22.0	4.0	4.0	.0	110.	1752.	68.2	251.4	49.4	7.0	7278.	70.0	.0	207.	17.0	69.9	.001	-142.	1782.
10.1	5.0	5.0	.0	110.	802.	33.4	237.9	48.8	7.0	3344.	66.6	.0	156.	17.0	69.9	.354	-86.	817.
20.2	5.0	5.0	.0	110.	1605.	70.4	249.9	48.8	7.0	6688.	69.6	.0	209.	17.0	69.9	.001	-143.	1635.
9.3	6.0	6.0	.0	110.	737.	34.5	236.5	47.6	7.0	3084.	66.2	.0	157.	17.0	69.9	.306	-87.	753.
18.6	6.0	6.0	.0	110.	1474.	73.3	248.5	47.6	7.0	6167.	69.2	.0	212.	17.0	69.9	.000	-145.	1505.
8.6	7.0	7.0	.0	110.	679.	35.9	235.1	46.0	7.0	2854.	65.9	.0	159.	17.0	69.9	.244	-89.	695.
17.2	7.0	7.0	.0	110.	1359.	76.7	247.1	46.0	7.0	5708.	68.9	.0	216.	17.0	69.9	.000	-149.	1390.
8.0	8.0	8.0	.0	110.	628.	37.6	233.8	43.6	7.0	2651.	65.6	.0	162.	17.0	69.9	.171	-92.	644.
15.9	8.0	8.0	.0	110.	1256.	80.9	245.8	43.6	7.0	5302.	68.6	.0	221.	17.0	69.9	.000	-154.	1288.
7.4	9.0	9.0	.0	110.	583.	39.6	232.5	41.4	7.0	2472.	65.3	.0	166.	17.0	69.9	.117	-96.	599.
14.8	9.0	9.0	.0	110.	1165.	85.9	244.5	41.4	7.0	4944.	68.3	.0	228.	17.0	69.9	.000	-160.	1198.
6.9	10.0	10.0	.0	110.	542.	42.0	231.3	40.6	7.0	2314.	65.0	.0	168.	17.0	69.9	.091	-98.	559.
13.8	10.0	10.0	.0	110.	1084.	91.8	243.3	40.6	7.0	4628.	68.0	.0	233.	17.0	69.9	.000	-166.	1118.
6.5	11.0	11.0	.0	110.	506.	44.8	230.2	40.6	7.0	2174.	64.7	.0	170.	17.0	69.9	.073	-100.	524.
12.9	11.0	11.0	.0	110.	1012.	93.9	242.2	40.6	7.0	4347.	67.7	.0	240.	17.0	69.9	.000	-172.	1047.
6.1	12.0	12.0	.0	110.	473.	48.0	229.1	39.8	7.0	2049.	64.5	.0	173.	17.0	69.9	.050	-103.	492.
12.2	12.0	12.0	.0	110.	947.	107.3	241.1	39.8	7.0	4093.	67.5	.0	248.	17.0	69.9	.000	-180.	984.
5.7	13.0	13.0	.0	110.	444.	51.8	228.1	39.0	7.0	1933.	64.2	.0	177.	17.0	69.9	.033	-107.	463.
11.4	13.0	13.0	.0	110.	888.	117.2	240.1	39.0	7.0	3876.	67.2	.0	258.	17.0	69.9	.000	-190.	927.
5.4	14.0	14.0	.0	110.	418.	56.2	227.1	37.4	7.0	1839.	64.0	.0	182.	17.0	69.9	.018	-112.	438.
10.8	14.0	14.0	.0	110.	836.	128.9	239.1	37.4	7.0	3677.	67.0	.0	270.	17.0	69.9	.000	-202.	876.
5.1	15.0	15.0	.0	110.	394.	61.3	226.2	34.6	7.0	1750.	63.8	.0	189.	17.0	69.9	.008	-119.	415.
10.2	15.0	15.0	.0	110.	788.	142.8	238.2	34.6	7.0	3499.	66.8	.0	286.	17.0	69.9	.000	-218.	829.
4.9	16.0	16.0	.0	110.	372.	67.3	225.3	33.0	7.0	1670.	63.6	.0	196.	17.0	69.9	.004	-126.	394.
9.7	16.0	16.0	.0	110.	745.	153.3	237.3	33.0	7.0	3339.	66.6	.0	304.	17.0	69.9	.000	-236.	788.
4.6	17.0	17.0	.0	110.	353.	74.3	224.4	29.0	7.0	1598.	63.4	.0	206.	17.0	69.9	.001	-136.	375.
9.3	17.0	17.0	.0	110.	705.	179.0	236.4	29.0	7.0	3195.	66.4	.0	327.	17.0	69.9	.000	-259.	750.
4.4	18.0	18.0	.0	110.	335.	82.5	223.6	26.0	7.0	1533.	63.2	.0	217.	17.0	69.9	.000	-147.	358.
8.8	18.0	18.0	.0	110.	669.	202.6	235.6	26.0	7.0	3065.	66.2	.0	353.	17.0	69.9	.000	-284.	715.
4.2	19.0	19.0	.0	110.	318.	92.2	222.8	24.0	7.0	1474.	63.0	.0	228.	17.0	69.9	.000	-158.	342.
8.4	19.0	19.0	.0	110.	636.	230.9	234.8	24.0	7.0	2948.	66.0	.0	382.	17.0	69.9	.000	-314.	684.
4.0	20.0	20.0	.0	110.	303.	103.5	222.1	21.0	7.0	1421.	62.9	.0	242.	17.0	69.9	.000	-172.	328.
8.1	20.0	20.0	.0	110.	605.	265.0	234.1	21.0	7.0	2841.	65.9	.0	419.	17.0	69.9	.000	-351.	655.
3.9	21.0	21.0	.0	110.	289.	116.8	221.3	20.0	7.0	1372.	62.7	.0	255.	17.0	69.9	.000	-186.	314.
7.8	21.0	21.0	.0	110.	577.	306.2	233.3	20.0	7.0	2744.	65.7	.0	461.	17.0	69.9	.000	-392.	629.
3.7	22.0	22.0	.0	110.	276.	132.6	220.7	19.0	7.0	1328.	62.6	.0	272.	17.0	69.9	.000	-202.	302.
7.6	22.0	22.0	.0	110.	551.	356.4	232.7	19.0	7.0	2656.	65.6	.0	511.	17.0	69.9	.000	-443.	604.
3.6	23.0	23.0	.0	110.	263.	151.4	220.0	18.0	7.0	1288.	62.4	.0	291.	17.0	69.9	.000	-221.	291.
7.2	23.0	23.0	.0	110.	527.	417.6	232.0	18.0	7.0	2576.	65.4	.0	573.	17.0	69.9	.000	-504.	582.
3.5	24.0	24.0	.0	110.	252.	173.6	219.4	16.0	7.0	1251.	62.3	.0	315.	17.0	69.9	.000	-245.	281.
6.9	24.0	24.0	.0	110.	504.	492.7	231.4	16.0	7.0	2503.	65.3	.0	650.	17.0	69.9	.000	-581.	561.
3.3	25.0	25.0	.0	110.	241.	200.2	218.8	16.0	7.0	1218.	62.2	.0	341.	17.0	69.9	.000	-271.	271.
6.7	25.0	25.0	.0	110.	483.	585.2	230.8	16.0	7.0	2436.	65.2	.0	741.	17.0	69.9	.000	-673.	542.

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3.2	26.0	26.0	.0	110.	232.	231.9	218.2	15.0	7.0	1188.	62.1	.0	373.	17.0	69.9	.000	-303.	262.
6.5	26.0	26.0	.0	110.	463.	679.7	230.2	15.0	7.0	2376.	65.1	.0	837.	17.0	69.9	.000	-768.	524.
3.1	27.0	27.0	.0	110.	222.	270.0	217.6	13.8	7.0	1160.	62.0	.0	412.	17.0	69.9	.000	-342.	254.
6.3	27.0	27.0	.0	110.	444.	717.8	229.6	13.8	7.0	2320.	65.0	.0	875.	17.0	69.9	.000	-807.	507.
3.0	28.0	28.0	.0	110.	213.	315.8	217.1	9.0	7.0	1135.	61.9	.0	462.	17.0	69.9	.000	-392.	246.
6.1	28.0	28.0	.0	110.	427.	763.6	229.1	9.0	7.0	2270.	64.9	.0	926.	17.0	69.9	.000	-857.	492.
2.9	29.0	29.0	.0	110.	205.	371.1	216.6	8.0	7.0	1112.	61.8	.0	518.	17.0	69.9	.000	-448.	239.
5.9	29.0	29.0	.0	110.	410.	813.9	228.6	8.0	7.0	2224.	64.8	.0	981.	17.0	69.9	.000	-913.	477.
2.9	30.0	30.0	.0	110.	197.	437.9	216.1	4.0	7.0	1091.	61.7	.0	588.	17.0	69.9	.000	-518.	232.
5.7	30.0	30.0	.0	110.	395.	885.7	228.1	4.0	7.0	2182.	64.7	.0	1052.	17.0	69.9	.000	-983.	464.

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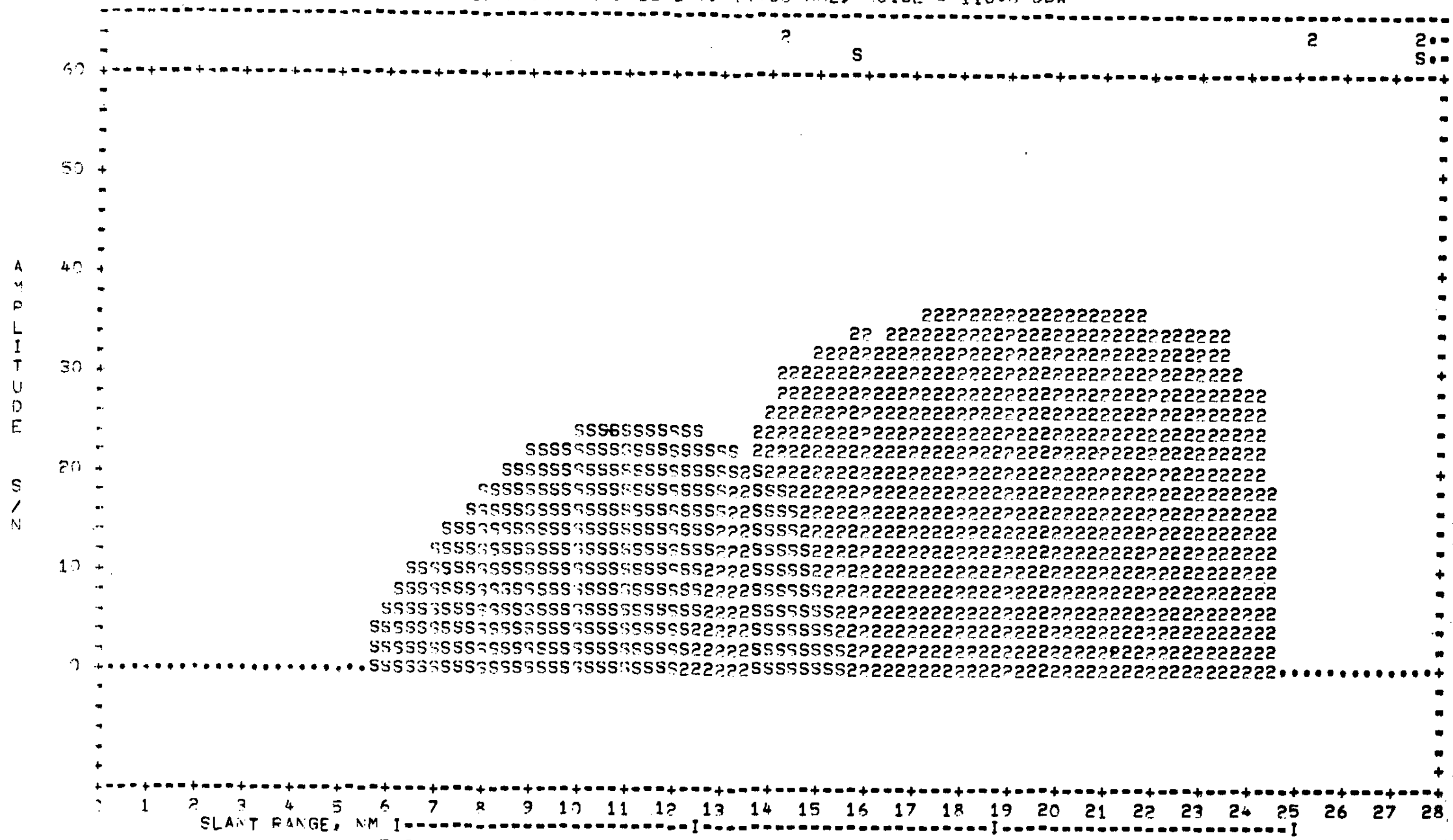
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT. = VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 14.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	25.2	14.4	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	14.9	.0	.1
GROUND OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	12.6	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	.3	.7	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	277.6	336.8	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	1946.0	1077.2	1269.4	1259.7

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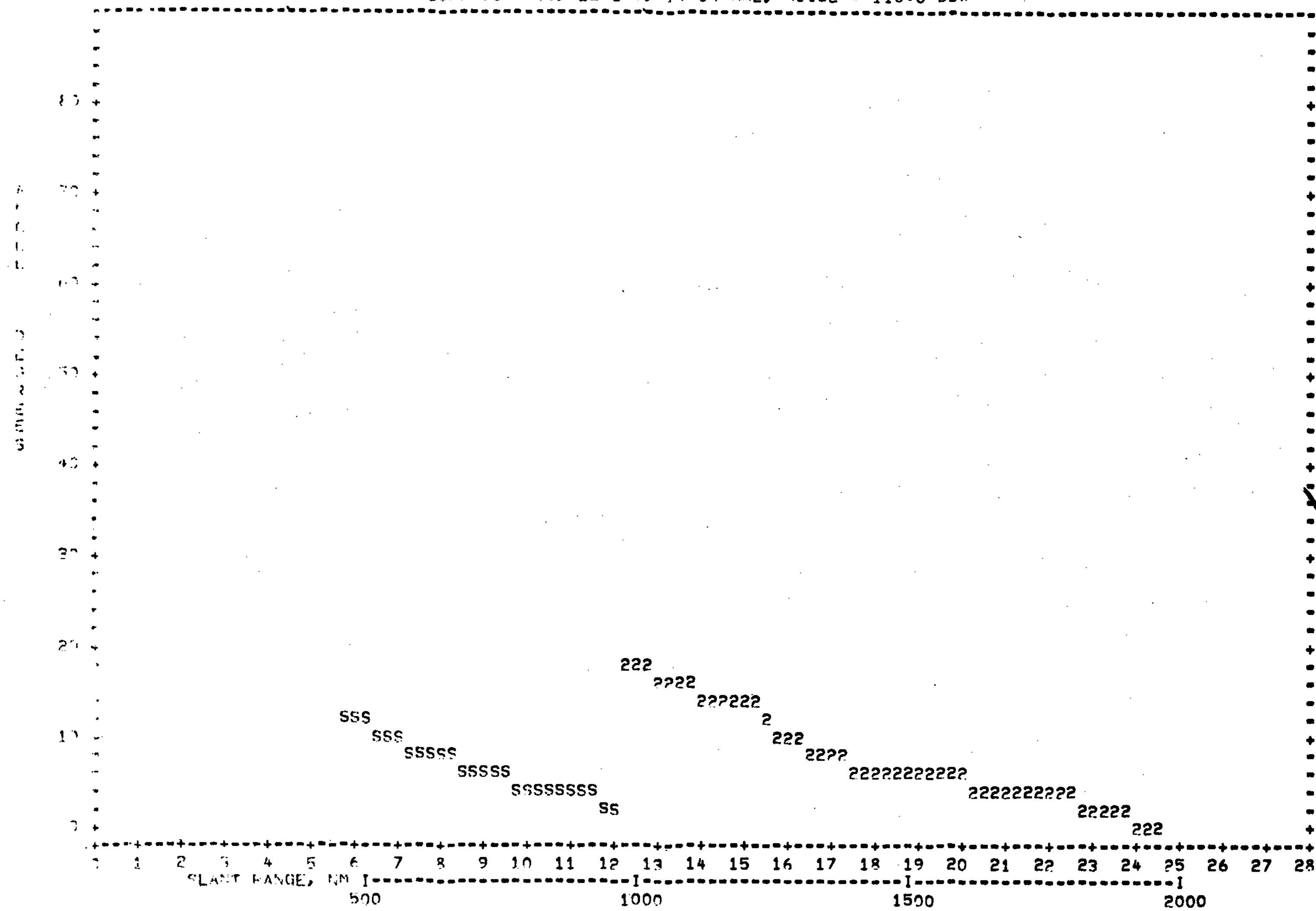
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 14.00 MHZ, NOISE = 110.0 DBW



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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 14.00 MHZ

F2-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
24.7	.0	.3	.3	278.	1946.	3.4	253.5	-31.0	7.0	7455.	70.1	9.3	227.	17.0	69.9	.000	-157.	2001.
24.2	.7	.3	.3	278.	1906.	3.4	253.2	19.0	7.0	7377.	70.0	9.3	183.	17.0	69.9	.016	-113.	1961.
23.9	1.5	.3	.2	278.	1876.	3.3	252.9	13.0	7.0	7478.	70.1	9.2	182.	17.0	69.9	.017	-112.	1932.
23.6	2.2	.3	.1	278.	1854.	3.3	252.7	23.8	7.0	7741.	70.2	9.1	171.	17.0	69.9	.061	-101.	1912.
22.5	3.0	1.3	.1	279.	1763.	3.3	251.9	30.0	7.0	7423.	70.0	9.0	164.	17.0	69.9	.138	-94.	1821.
22.7	3.7	.3	.3	280.	1780.	3.3	252.0	34.0	7.0	7292.	70.0	8.9	160.	17.0	69.9	.217	-90.	1837.
22.0	4.5	.3	.6	281.	1727.	3.2	251.5	34.0	7.0	6673.	69.6	8.7	160.	17.0	69.9	.225	-90.	1783.
20.9	5.2	2.0	.3	283.	1634.	3.1	250.6	37.4	7.0	6904.	69.7	8.5	155.	17.0	69.9	.388	-85.	1693.
18.8	6.0	5.1	.1	284.	1458.	3.0	248.7	41.0	7.0	6213.	69.3	8.3	150.	17.0	69.9	.725	-80.	1518.
18.5	6.7	5.0	.3	286.	1437.	2.9	248.5	42.4	7.0	6127.	69.2	8.1	148.	17.0	69.9	.897	-78.	1498.
17.4	7.4	6.7	.1	287.	1346.	2.8	247.4	42.4	7.0	5779.	69.0	7.8	147.	17.0	69.9	1.029	-77.	1409.
16.9	8.2	7.3	.2	291.	1308.	2.7	246.9	45.0	7.0	5635.	68.9	7.6	143.	17.0	69.9	1.500	-73.	1372.
16.5	8.9	7.7	.3	292.	1271.	2.6	246.[illegible]	45.8	7.0	5491.	68.7	7.4	142.	17.0	69.9	1.775	-72.	1335.
16.5	9.7	7.4	.5	295.	1267.	2.6	246.5	47.0	7.0	5479.	68.7	7.1	140.	17.0	69.9	2.106	-71.	1333.
15.8	10.4	8.6	.4	298.	1211.	2.5	245.7	47.0	7.0	5270.	68.6	6.9	140.	17.0	69.9	2.338	-70.	1279.
15.6	11.2	8.8	.6	303.	1196.	2.4	245.5	47.4	7.0	5218.	68.5	6.7	139.	17.0	69.9	2.571	-69.	1265.
15.0	11.9	10.2	.4	306.	1140.	2.3	244.8	48.8	7.0	5016.	68.3	6.4	136.	17.0	69.9	3.361	-66.	1211.
15.5	12.7	8.9	1.0	313.	1181.	2.3	245.4	48.8	7.0	5176.	68.5	6.2	137.	17.0	69.9	3.244	-67.	1255.
14.4	13.4	11.8	.4	318.	1085.	2.1	244.1	48.8	7.0	4842.	68.2	6.0	135.	17.0	69.9	3.829	-65.	1163.
15.5	14.1	8.9	1.4	325.	1174.	2.3	245.4	49.0	7.0	5167.	68.5	5.8	136.	17.0	69.9	3.513	-66.	1252.
14.4	14.9	12.6	.7	337.	1077.	2.0	244.1	49.0	7.0	4854.	68.2	5.7	135.	17.0	69.9	4.147	-65.	1162.
13.7	15.9	13.7	.7	337.	1026.	1.9	243.3	48.8	7.0	4668.	68.0	5.4	134.	17.0	69.9	2.273	-70.	1113.
13.2	16.9	14.8	.7	337.	979.	1.8	242.6	48.6	7.0	4499.	67.9	5.2	133.	17.0	69.9	1.462	-74.	1067.
12.7	17.9	15.9	.7	337.	935.	1.8	241.9	48.0	7.0	4343.	67.7	5.1	133.	17.0	69.9	.751	-79.	1025.
12.2	18.9	16.9	.7	337.	894.	1.7	241.2	47.4	7.0	4201.	67.6	4.9	133.	17.0	69.9	.324	-87.	986.
11.7	19.9	18.0	.7	337.	856.	1.6	240.6	46.8	7.0	4070.	67.4	4.7	133.	17.0	69.9	.116	-96.	950.
11.3	20.9	19.0	.7	337.	820.	1.6	239.9	45.4	7.0	3950.	67.3	4.6	133.	17.0	69.9	.022	-110.	916.
10.9	21.9	20.1	.7	337.	787.	1.5	239.3	44.0	7.0	3840.	67.2	4.5	134.	17.0	69.9	.004	-124.	885.
10.6	22.9	21.1	.7	337.	755.	1.4	238.8	42.4	7.0	3738.	67.1	4.4	135.	17.0	69.9	.004	-125.	856.
10.2	23.9	22.1	.7	337.	726.	1.4	238.2	41.0	7.0	3644.	67.0	4.4	136.	17.0	69.9	.004	-126.	828.
9.9	24.9	23.2	.7	337.	698.	1.3	237.6	38.6	7.0	3558.	66.9	4.3	138.	17.0	69.9	.003	-128.	803.

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F2-LAYER, 2-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
47.2	1.3	.3	.3	292.	1941.	3.3	13.2	.0	7.0	14442.	72.9	4.4	182.	17.0	69.9	.017	-112.	3823.
45.3	2.0	.3	.3	292.	1909.	3.3	13.7	.0	7.0	13981.	72.8	4.4	173.	17.0	69.9	.047	-104.	3663.
38.9	5.1	4.6	.1	299.	1564.	3.0	12.9	.0	7.0	12868.	72.4	3.7	166.	17.0	69.9	.109	-96.	3148.
38.6	5.0	4.7	.1	299.	1560.	3.0	13.0	.0	7.0	12768.	72.4	3.8	164.	17.0	69.9	.133	-95.	3122.
36.3	6.7	5.7	.3	303.	1466.	2.9	13.1	.0	7.0	12046.	72.2	3.3	163.	17.0	69.9	.163	-93.	2942.
36.4	7.3	4.3	.9	306.	1510.	2.9	13.6	.0	7.0	11234.	71.8	3.1	160.	17.0	69.9	.223	-90.	2949.
34.8	7.7	6.3	[illegible]	307.	1413.	2.8	13.2	.0	7.0	11549.	72.0	3.0	158.	17.0	69.9	.290	-88.	2817.
35.5	7.4	5.0	.6	306.	1475.	2.8	13.6	.0	7.0	11528.	72.0	3.0	157.	17.0	69.9	.322	-87.	2876.
33.3	8.6	7.7	.4	313.	1343.	2.6	13.2	.0	7.0	11074.	71.8	2.7	155.	17.0	69.9	.403	-85.	2693.
32.9	8.8	7.9	.4	313.	1326.	2.6	13.2	.0	7.0	10956.	71.7	2.6	154.	17.0	69.9	.448	-84.	2663.
31.6	10.2	9.2	.5	323.	1268.	2.4	13.2	.0	7.0	10548.	71.6	2.2	151.	17.0	69.9	.624	-81.	2555.
32.7	8.9	8.0	.4	313.	1323.	2.6	13.2	.0	7.0	10901.	71.7	2.6	152.	17.0	69.9	.564	-82.	2649.
31.8	11.6	7.6	1.9	342.	1328.	2.4	14.1	.0	7.0	9758.	71.2	1.8	153.	17.0	69.9	.491	-83.	2574.
32.6	8.9	8.2	.3	313.	1314.	2.6	13.2	.0	7.0	10861.	71.7	2.6	151.	17.0	69.9	.616	-81.	2638.
31.1	12.6	8.6	1.9	342.	1271.	2.3	13.7	.0	7.0	10267.	71.5	1.6	153.	17.0	69.9	.478	-83.	2516.
29.5	13.7	10.0	1.9	342.	1194.	2.2	13.6	.0	7.0	9897.	71.3	1.3	162.	17.0	69.9	.174	-92.	2391.
28.2	14.8	11.4	1.9	342.	1126.	2.1	13.5	.0	7.0	9478.	71.1	1.1	171.	17.0	69.9	.061	-101.	2280.
26.9	15.9	12.6	1.9	342.	1067.	2.0	13.4	.0	7.0	9103.	70.9	.9	184.	17.0	69.9	.014	-114.	2180.
25.8	16.9	13.8	1.9	342.	1013.	1.9	13.3	.0	7.0	8766.	70.8	.7	200.	17.0	69.9	.002	-130.	2089.
24.3	18.0	15.0	1.9	342.	963.	1.8	13.2	.0	7.0	8460.	70.6	.6	221.	17.0	69.9	.000	-151.	2005.
23.3	19.0	16.2	1.9	342.	918.	1.7	13.2	.0	7.0	8182.	70.5	.5	252.	17.0	69.9	.000	-182.	1928.
22.9	20.1	17.3	1.9	342.	877.	1.6	13.1	.0	7.0	7928.	70.3	.4	266.	17.0	69.9	.000	-196.	1857.
22.1	21.1	18.4	1.9	342.	838.	1.6	13.1	.0	7.0	7696.	70.2	.3	267.	17.0	69.9	.000	-197.	1792.
21.4	22.1	19.5	1.9	342.	803.	1.5	13.1	.0	7.0	7483.	70.1	.2	268.	17.0	69.9	.000	-198.	1731.
20.7	23.2	20.6	1.9	342.	769.	1.4	13.0	.0	7.0	7288.	70.0	.2	269.	17.0	69.9	.000	-199.	1674.

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JU SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 14.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDNM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	30.8	245.8	-31.0	7.0	5232.	68.5	.0	239.	17.0	69.9	.000	-169.	1284.
31.7	.0	.0	.0	110.	2539.	64.4	257.8	-31.0	7.0	10464.	71.5	.0	288.	17.0	69.9	.000	-219.	2568.
14.4	1.0	1.0	.0	110.	1155.	30.9	244.2	13.0	7.0	4766.	68.1	.0	194.	17.0	69.9	.004	-124.	1169.
28.9	1.0	1.0	.0	110.	2310.	64.7	256.2	13.0	7.0	9533.	71.1	.0	243.	17.0	69.9	.000	-177.	2339.
13.2	2.0	2.0	.0	110.	1052.	31.2	242.6	23.8	7.0	4347.	67.7	.0	182.	17.0	69.9	.017	-112.	1066.
26.3	2.0	2.0	.0	110.	2103.	65.4	254.6	23.8	7.0	8694.	70.7	.0	232.	17.0	69.9	.000	-167.	2132.
12.0	3.0	3.0	.0	110.	959.	31.7	241.0	30.0	7.0	3972.	67.3	.0	175.	17.0	69.9	.038	-105.	973.
24.1	3.0	3.0	.0	110.	1918.	66.5	253.0	30.0	7.0	7944.	70.3	.0	226.	17.0	69.9	.000	-161.	1947.
11.0	4.0	4.0	.0	110.	876.	32.4	239.4	34.0	7.0	3639.	67.0	.0	171.	17.0	69.9	.063	-101.	891.
22.0	4.0	4.0	.0	110.	1752.	68.2	251.4	34.0	7.0	7278.	70.0	.0	222.	17.0	69.9	.000	-157.	1782.
10.1	5.0	5.0	.0	110.	802.	33.4	237.9	37.4	7.0	3344.	66.6	.0	167.	17.0	69.9	.095	-97.	817.
20.2	5.0	5.0	.0	110.	1605.	70.4	249.9	37.4	7.0	6688.	69.6	.0	220.	17.0	69.9	.000	-154.	1635.
9.3	6.0	6.0	.0	110.	737.	34.5	236.5	41.0	7.0	3084.	66.2	.0	164.	17.0	69.9	.143	-94.	753.
18.6	6.0	6.0	.0	110.	1474.	73.3	248.5	41.0	7.0	6167.	69.2	.0	218.	17.0	69.9	.000	-152.	1505.
8.6	7.0	7.0	.0	110.	679.	35.3	235.1	42.4	7.0	2854.	65.9	.0	163.	17.0	69.9	.161	-93.	695.
17.2	7.0	7.0	.0	110.	1359.	76.7	247.1	42.4	7.0	5708.	68.9	.0	219.	17.0	69.9	.000	-153.	1390.
8.0	8.0	8.0	.0	110.	628.	37.6	233.8	45.0	7.0	2651.	65.6	.0	161.	17.0	69.9	.201	-91.	644.
15.9	8.0	8.0	.0	110.	1256.	80.9	245.8	45.0	7.0	5302.	68.6	.0	220.	17.0	69.9	.000	-153.	1288.
7.4	9.0	9.0	.0	110.	583.	39.6	232.5	45.8	7.0	2472.	65.3	.0	161.	17.0	69.9	.195	-91.	599.
14.8	9.0	9.0	.0	110.	1165.	85.9	244.5	45.8	7.0	4944.	68.3	.0	223.	17.0	69.9	.000	-156.	1198.
6.9	10.0	10.0	.0	110.	542.	42.0	231.3	47.0	7.0	2314.	65.0	.0	161.	17.0	69.9	.189	-91.	559.
13.7	10.0	10.0	.0	110.	1084.	91.8	243.3	47.0	7.0	4628.	68.0	.0	227.	17.0	69.9	.000	-160.	1118.
6.5	11.0	11.0	.0	110.	506.	44.8	230.2	47.4	7.0	2174.	64.7	.0	163.	17.0	69.9	.159	-93.	524.
12.9	11.0	11.0	.0	110.	1012.	98.9	242.2	47.4	7.0	4347.	67.7	.0	233.	17.0	69.9	.000	-165.	1047.
6.1	12.0	12.0	.0	110.	473.	48.0	229.1	48.8	7.0	2049.	64.5	.0	164.	17.0	69.9	.142	-94.	492.
12.2	12.0	12.0	.0	110.	947.	107.3	241.1	48.8	7.0	4098.	67.5	.0	239.	17.0	69.9	.000	-171.	984.
5.7	13.0	13.0	.0	110.	444.	51.8	228.1	48.8	7.0	1938.	64.2	.0	167.	17.0	69.9	.100	-97.	463.
11.4	13.0	13.0	.0	110.	888.	117.2	240.1	48.8	7.0	3876.	67.2	.0	248.	17.0	69.9	.000	-180.	927.
5.4	14.0	14.0	.0	110.	418.	56.2	227.1	49.0	7.0	1839.	64.0	.0	170.	17.0	69.9	.068	-100.	438.
10.8	14.0	14.0	.0	110.	836.	128.9	239.1	49.0	7.0	3677.	67.0	.0	259.	17.0	69.9	.000	-191.	876.
5.1	15.0	15.0	.0	110.	394.	61.3	226.2	49.0	7.0	1750.	63.8	.0	175.	17.0	69.9	.041	-105.	415.
10.2	15.0	15.0	.0	110.	788.	142.8	238.2	49.0	7.0	3499.	66.8	.0	272.	17.0	69.9	.000	-204.	829.
4.9	16.0	16.0	.0	110.	372.	67.3	225.3	48.8	7.0	1670.	63.6	.0	180.	17.0	69.9	.022	-110.	394.
9.7	16.0	16.0	.0	110.	745.	159.3	237.3	48.8	7.0	3339.	66.6	.0	288.	17.0	69.9	.000	-220.	788.
4.6	17.0	17.0	.0	110.	353.	74.3	224.4	48.6	7.0	1598.	63.4	.0	187.	17.0	69.9	.010	-117.	375.
9.3	17.0	17.0	.0	110.	705.	179.0	236.4	48.6	7.0	3195.	66.4	.0	307.	17.0	69.9	.000	-239.	750.
4.4	18.0	18.0	.0	110.	335.	82.5	223.6	48.0	7.0	1533.	63.2	.0	195.	17.0	69.9	.004	-125.	358.
8.9	18.0	18.0	.0	110.	669.	202.6	235.6	48.0	7.0	3065.	66.2	.0	331.	17.0	69.9	.000	-262.	715.
4.2	19.0	19.0	.0	110.	318.	92.2	222.8	47.4	7.0	1474.	63.0	.0	205.	17.0	69.9	.001	-135.	342.
8.4	19.0	19.0	.0	110.	636.	230.9	234.8	47.4	7.0	2948.	66.0	.0	359.	17.0	69.9	.000	-291.	684.
4.0	20.0	20.0	.0	110.	303.	103.5	222.1	46.8	7.0	1421.	62.9	.0	216.	17.0	69.9	.000	-146.	328.
8.1	20.0	20.0	.0	110.	605.	265.0	234.1	46.8	7.0	2841.	65.9	.0	393.	17.0	69.9	.000	-325.	655.
3.9	21.0	21.0	.0	110.	289.	116.8	221.3	45.4	7.0	1372.	62.7	.0	230.	17.0	69.9	.000	-160.	314.
7.8	21.0	21.0	.0	110.	577.	306.2	233.3	45.4	7.0	2744.	65.7	.0	435.	17.0	69.9	.000	-367.	629.
3.7	22.0	22.0	.0	110.	276.	132.6	220.7	44.0	7.0	1328.	62.6	.0	247.	17.0	69.9	.000	-177.	302.
7.5	22.0	22.0	.0	110.	551.	356.4	232.7	44.0	7.0	2656.	65.6	.0	486.	17.0	69.9	.000	-418.	604.
3.6	23.0	23.0	.0	110.	263.	151.4	220.0	42.4	7.0	1288.	62.4	.0	267.	17.0	69.9	.000	-197.	291.
7.2	23.0	23.0	.0	110.	527.	417.6	232.0	42.4	7.0	2576.	65.4	.0	549.	17.0	69.9	.000	-480.	582.
3.5	24.0	24.0	.0	110.	252.	173.6	219.4	41.0	7.0	1251.	62.3	.0	290.	17.0	69.9	.000	-220.	281.
6.9	24.0	24.0	.0	110.	504.	492.7	231.4	41.0	7.0	2503.	65.3	.0	625.	17.0	69.9	.000	-556.	561.
3.3	25.0	25.0	.0	110.	241.	200.2	218.3	38.6	7.0	1218.	62.2	.0	318.	17.0	69.9	.000	-248.	271.
6.7	25.0	25.0	.0	110.	483.	585.2	230.8	38.6	7.0	2436.	65.2	.0	719.	17.0	69.9	.000	-650.	542.

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3.[illegible]	26.0	26.0	.0	110.	232.	231.9	218.2	34.6	7.0	1188.	62.1	.0	351.	17.0	69.9	.000	-282.	262.
6.[illegible]	26.0	[illegible]	.0	110.	463.	673.7	230.2	34.6	7.0	2376.	65.1	.0	815.	17.0	69.9	.000	-746.	524.
3.1	27.0	27.0	.0	110.	222.	270.0	217.6	33.4	7.0	1160.	62.0	.0	392.	17.0	69.9	.000	-322.	254.
6.3	27.0	27.0	.0	110.	444.	717.8	229.6	33.4	7.0	2320.	65.0	.0	856.	17.0	69.9	.000	-787.	507.
3.0	28.0	28.0	.0	110.	213.	315.8	217.1	30.8	7.0	1135.	61.9	.0	440.	17.0	69.9	.000	-370.	246.
6.1	28.0	28.0	.0	110.	427.	763.6	229.1	30.8	7.0	2270.	64.9	.0	904.	17.0	69.9	.000	-835.	492.
2.9	29.0	29.0	.0	110.	205.	371.1	216.6	28.8	7.0	1112.	61.8	.0	497.	17.0	69.9	.000	-427.	239.
5.[illegible]	29.0	[illegible]	.0	110.	410.	813.9	228.6	28.8	7.0	2224.	64.8	.0	961.	17.0	69.9	.000	-892.	477.
2.[illegible]	30.0	30.0	.0	110.	197.	437.9	216.1	24.6	7.0	1091.	61.7	.0	568.	17.0	69.9	.000	-498.	232.
5.7	30.0	30.0	.0	110.	395.	385.7	228.1	24.6	7.0	2182.	64.7	.0	1031.	17.0	69.9	.000	-962.	464.

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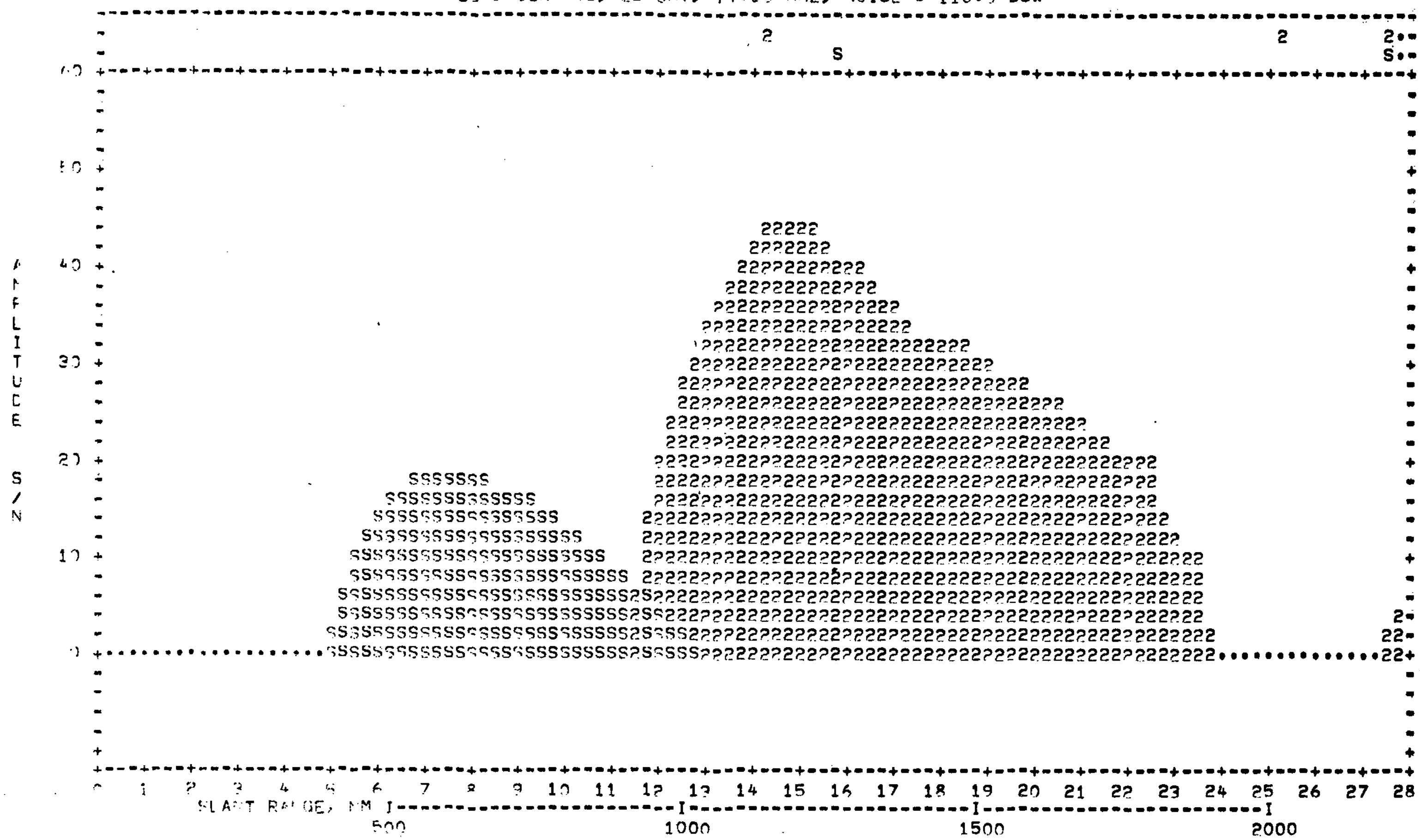
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT. = HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 14.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	25.2	14.4	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	.0	14.9	.0	.1
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	.3	12.6	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	.3	.7	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	277.6	336.8	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	2102.1	1163.6	1371.3	1360.7

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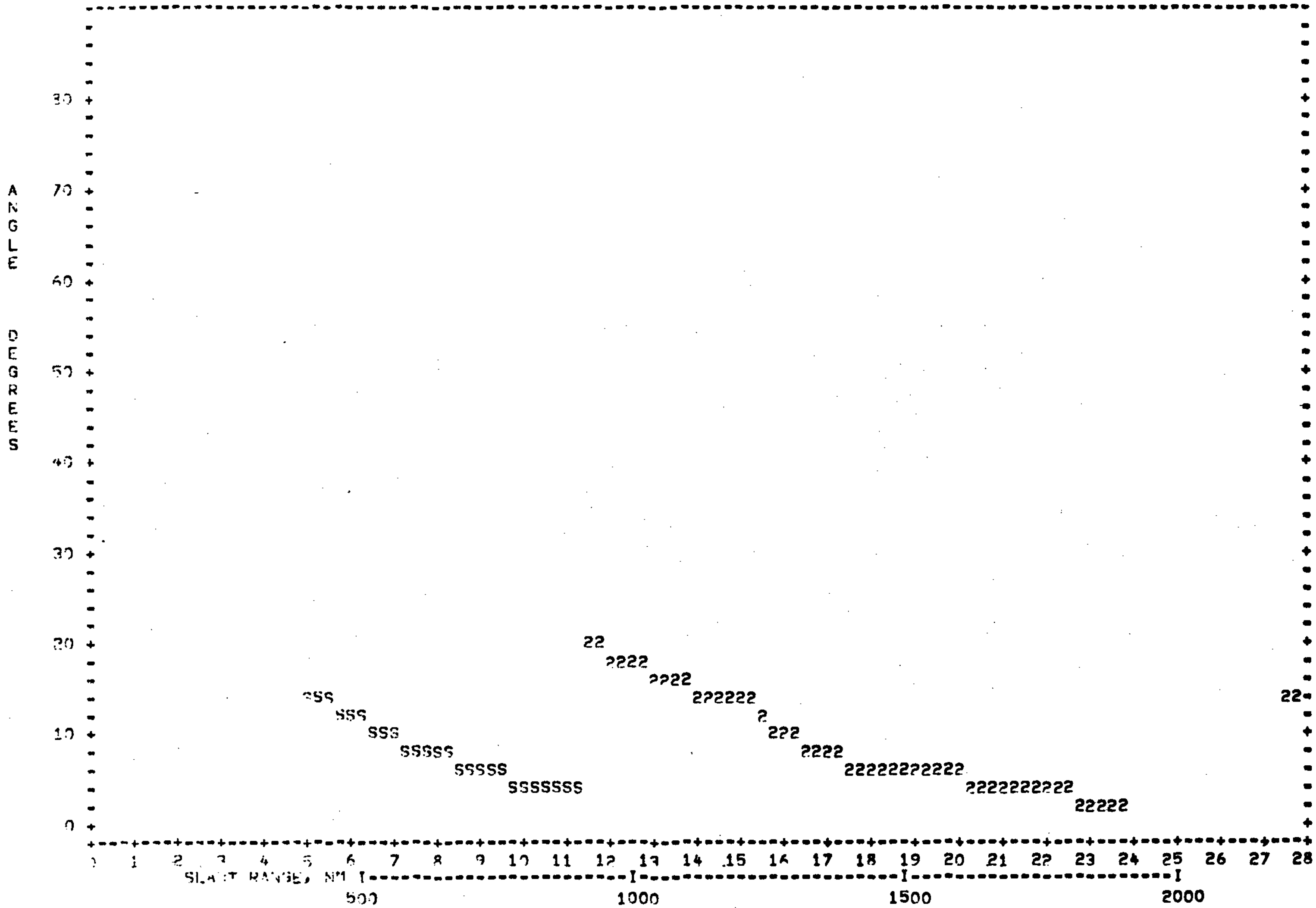
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 14.00 MHZ, NOISE = 110.0 DBW



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JUN SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 18.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDKM	ABS	FREE	ANT	BEAM	AREA	BACK	BBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	38.9	250.2	25.0	7.0	5232.	70.7	.0	193.	17.0	69.9	.005	-123.	1284.
31.7	.0	.0	.0	110.	2539.	84.2	262.2	25.0	7.0	10464.	73.7	.0	254.	17.0	69.9	.000	-184.	2568.
14.4	1.0	1.0	.0	110.	1155.	39.1	248.5	44.6	7.0	4766.	70.3	.0	173.	17.0	69.9	.051	-103.	1169.
28.9	1.0	1.0	.0	110.	2310.	84.7	260.5	44.6	7.0	9533.	73.3	.0	234.	17.0	69.9	.000	-168.	2339.
13.2	2.0	2.0	.0	110.	1052.	39.8	246.9	49.0	7.0	4347.	69.9	.0	168.	17.0	69.9	.090	-98.	1066.
26.3	2.0	2.0	.0	110.	2103.	86.2	258.9	49.0	7.0	8694.	72.9	.0	230.	17.0	69.9	.000	-165.	2132.
12.0	3.0	3.0	.0	110.	959.	40.8	245.3	49.8	7.0	3972.	69.5	.0	167.	17.0	69.9	.101	-97.	973.
24.1	3.0	3.0	.0	110.	1918.	88.8	257.3	49.8	7.0	7944.	72.5	.0	231.	17.0	69.9	.000	-166.	1947.
11.0	4.0	4.0	.0	110.	876.	42.3	243.8	49.4	7.0	3639.	69.1	.0	168.	17.0	69.9	.093	-98.	891.
22.0	4.0	4.0	.0	110.	1752.	92.6	255.8	49.4	7.0	7278.	72.1	.0	234.	17.0	69.9	.000	-168.	1782.
10.1	5.0	5.0	.0	110.	802.	44.3	242.3	48.8	7.0	3344.	68.8	.0	169.	17.0	69.9	.078	-99.	817.
20.2	5.0	5.0	.0	110.	1605.	97.6	254.3	48.8	7.0	6688.	71.8	.0	238.	17.0	69.9	.000	-172.	1635.
9.3	6.0	6.0	.0	110.	737.	46.8	240.9	47.6	7.0	3084.	68.4	.0	172.	17.0	69.9	.058	-102.	753.
18.6	6.0	6.0	.0	110.	1474.	104.2	252.9	47.6	7.0	6167.	71.4	.0	245.	17.0	69.9	.000	-179.	1505.
8.6	7.0	7.0	.0	110.	679.	50.1	239.5	46.0	7.0	2854.	68.1	.0	175.	17.0	69.9	.037	-106.	695.
17.2	7.0	7.0	.0	110.	1359.	112.6	251.5	46.0	7.0	5708.	71.1	.0	254.	17.0	69.9	.000	-187.	1390.
8.0	8.0	8.0	.0	110.	628.	54.1	238.2	43.6	7.0	2651.	67.8	.0	181.	17.0	69.9	.020	-111.	644.
15.9	8.0	8.0	.0	110.	1256.	123.2	250.2	43.6	7.0	5302.	70.8	.0	266.	17.0	69.9	.000	-199.	1288.
7.4	9.0	9.0	.0	110.	583.	59.0	236.9	41.4	7.0	2472.	67.5	.0	187.	17.0	69.9	.010	-117.	599.
14.8	9.0	9.0	.0	110.	1165.	136.4	248.9	41.4	7.0	4944.	70.5	.0	280.	17.0	69.9	.000	-213.	1198.
6.9	10.0	10.0	.0	110.	542.	65.0	235.7	40.6	7.0	2314.	67.2	.0	193.	17.0	69.9	.005	-123.	559.
13.8	10.0	10.0	.0	110.	1084.	152.9	247.7	40.6	7.0	4628.	70.2	.0	297.	17.0	69.9	.000	-230.	1118.
6.5	11.0	11.0	.0	110.	506.	72.4	234.6	40.6	7.0	2174.	66.9	.0	199.	17.0	69.9	.002	-130.	524.
12.9	11.0	11.0	.0	110.	1012.	173.5	246.6	40.6	7.0	4347.	69.9	.0	316.	17.0	69.9	.000	-249.	1047.
6.1	12.0	12.0	.0	110.	473.	81.4	233.5	39.8	7.0	2049.	66.6	.0	208.	17.0	69.9	.001	-139.	492.
12.2	12.0	12.0	.0	110.	947.	199.4	245.5	39.8	7.0	4098.	69.6	.0	342.	17.0	69.9	.000	-275.	984.
5.7	13.0	13.0	.0	110.	444.	92.6	232.4	39.0	7.0	1938.	66.4	.0	220.	17.0	69.9	.000	-150.	463.
11.4	13.0	13.0	.0	110.	888.	232.0	244.4	39.0	7.0	3876.	69.4	.0	375.	17.0	69.9	.000	-307.	927.
5.4	14.0	14.0	.0	110.	418.	106.3	231.5	37.4	7.0	1839.	66.2	.0	234.	17.0	69.9	.000	-164.	438.
10.8	14.0	14.0	.0	110.	836.	273.5	243.5	37.4	7.0	3677.	69.2	.0	417.	17.0	69.9	.000	-350.	876.
5.1	15.0	15.0	.0	110.	394.	123.3	230.5	34.6	7.0	1750.	66.0	.0	253.	17.0	69.9	.000	-183.	415.
10.2	15.0	15.0	.0	110.	788.	326.6	242.5	34.6	7.0	3499.	69.0	.0	472.	17.0	69.9	.000	-405.	829.
4.9	16.0	16.0	.0	110.	372.	144.5	229.6	33.0	7.0	1670.	65.8	.0	275.	17.0	69.9	.000	-205.	394.
9.7	16.0	16.0	.0	110.	745.	395.0	241.6	33.0	7.0	3339.	68.8	.0	542.	17.0	69.9	.000	-474.	788.
4.6	17.0	17.0	.0	110.	353.	171.1	228.8	29.0	7.0	1598.	65.6	.0	305.	17.0	69.9	.000	-235.	375.
9.3	17.0	17.0	.0	110.	705.	484.0	240.8	29.0	7.0	3195.	68.6	.0	634.	17.0	69.9	.000	-566.	750.
4.4	18.0	18.0	.0	110.	335.	204.6	228.0	26.0	7.0	1533.	65.4	.0	341.	17.0	69.9	.000	-271.	358.
8.8	18.0	18.0	.0	110.	669.	600.8	240.0	26.0	7.0	3065.	68.4	.0	753.	17.0	69.9	.000	-685.	715.
4.2	19.0	19.0	.0	110.	318.	247.1	227.2	24.0	7.0	1474.	65.2	.0	385.	17.0	69.9	.000	-315.	342.
8.4	19.0	19.0	.0	110.	636.	694.9	239.2	24.0	7.0	2948.	68.2	.0	849.	17.0	69.9	.000	-781.	684.
4.0	20.0	20.0	.0	110.	303.	301.4	226.4	21.0	7.0	1421.	65.1	.0	442.	17.0	69.9	.000	-372.	328.
8.1	20.0	20.0	.0	110.	605.	749.2	238.4	21.0	7.0	2841.	68.1	.0	905.	17.0	69.9	.000	-837.	655.
3.9	21.0	21.0	.0	110.	289.	371.1	225.7	20.0	7.0	1372.	64.9	.0	512.	17.0	69.9	.000	-442.	314.
7.8	21.0	21.0	.0	110.	577.	818.9	237.7	20.0	7.0	2744.	67.9	.0	975.	17.0	69.9	.000	-907.	629.
3.7	22.0	22.0	.0	110.	276.	447.8	225.0	19.0	7.0	1328.	64.8	.0	589.	17.0	69.9	.000	-519.	302.
7.5	22.0	22.0	.0	110.	551.	895.6	237.0	19.0	7.0	2656.	67.8	.0	1053.	17.0	69.9	.000	-984.	604.
3.6	23.0	23.0	.0	110.	263.	447.8	224.4	18.0	7.0	1288.	64.6	.0	590.	17.0	69.9	.000	-520.	291.
7.2	23.0	23.0	.0	110.	527.	895.6	236.4	18.0	7.0	2576.	67.6	.0	1053.	17.0	69.9	.000	-985.	582.
3.5	24.0	24.0	.0	110.	252.	447.8	223.7	16.0	7.0	1251.	64.5	.0	591.	17.0	69.9	.000	-521.	281.
6.9	24.0	24.0	.0	110.	504.	895.6	235.7	16.0	7.0	2503.	67.5	.0	1055.	17.0	69.9	.000	-986.	561.
3.3	25.0	25.0	.0	110.	241.	447.8	223.1	16.0	7.0	1218.	64.4	.0	591.	17.0	69.9	.000	-521.	271.
6.7	25.0	25.0	.0	110.	483.	895.6	235.1	16.0	7.0	2436.	67.4	.0	1054.	17.0	69.9	.000	-986.	542.

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3.2	26.0	26.0	.0	110.	232.	447.8	222.5	15.0	7.0	1188.	64.3	.0	591.	17.0	69.9	.000	-521.	262.
6.5	26.0	26.0	.0	110.	463.	895.6	234.5	15.0	7.0	2376.	67.3	.0	1055.	17.0	69.9	.000	-986.	524.
3.1	27.0	27.0	.0	110.	222.	447.8	222.0	13.8	7.0	1160.	64.2	.0	592.	17.0	69.9	.000	-522.	254.
6.3	27.0	27.0	.0	110.	444.	895.6	234.0	13.8	7.0	2320.	67.2	.0	1055.	17.0	69.9	.000	-987.	507.
3.0	28.0	28.0	.0	110.	213.	447.8	221.4	9.0	7.0	1135.	64.1	.0	596.	17.0	69.9	.000	-526.	246.
6.1	28.0	28.0	.0	110.	427.	895.6	233.4	9.0	7.0	2270.	67.1	.0	1060.	17.0	69.9	.000	-991.	492.
2.9	29.0	29.0	.0	110.	205.	447.8	220.9	8.0	7.0	1112.	64.0	.0	597.	17.0	69.9	.000	-527.	239.
5.9	29.0	29.0	.0	110.	410.	895.6	232.9	8.0	7.0	2224.	67.0	.0	1060.	17.0	69.9	.000	-992.	477.
2.8	30.0	30.0	.0	110.	197.	447.8	220.4	4.0	7.0	1091.	63.9	.0	600.	17.0	69.9	.000	-530.	232.
5.7	30.0	30.0	.0	110.	395.	895.6	232.4	4.0	7.0	2182.	66.9	.0	1064.	17.0	69.9	.000	-995.	464.

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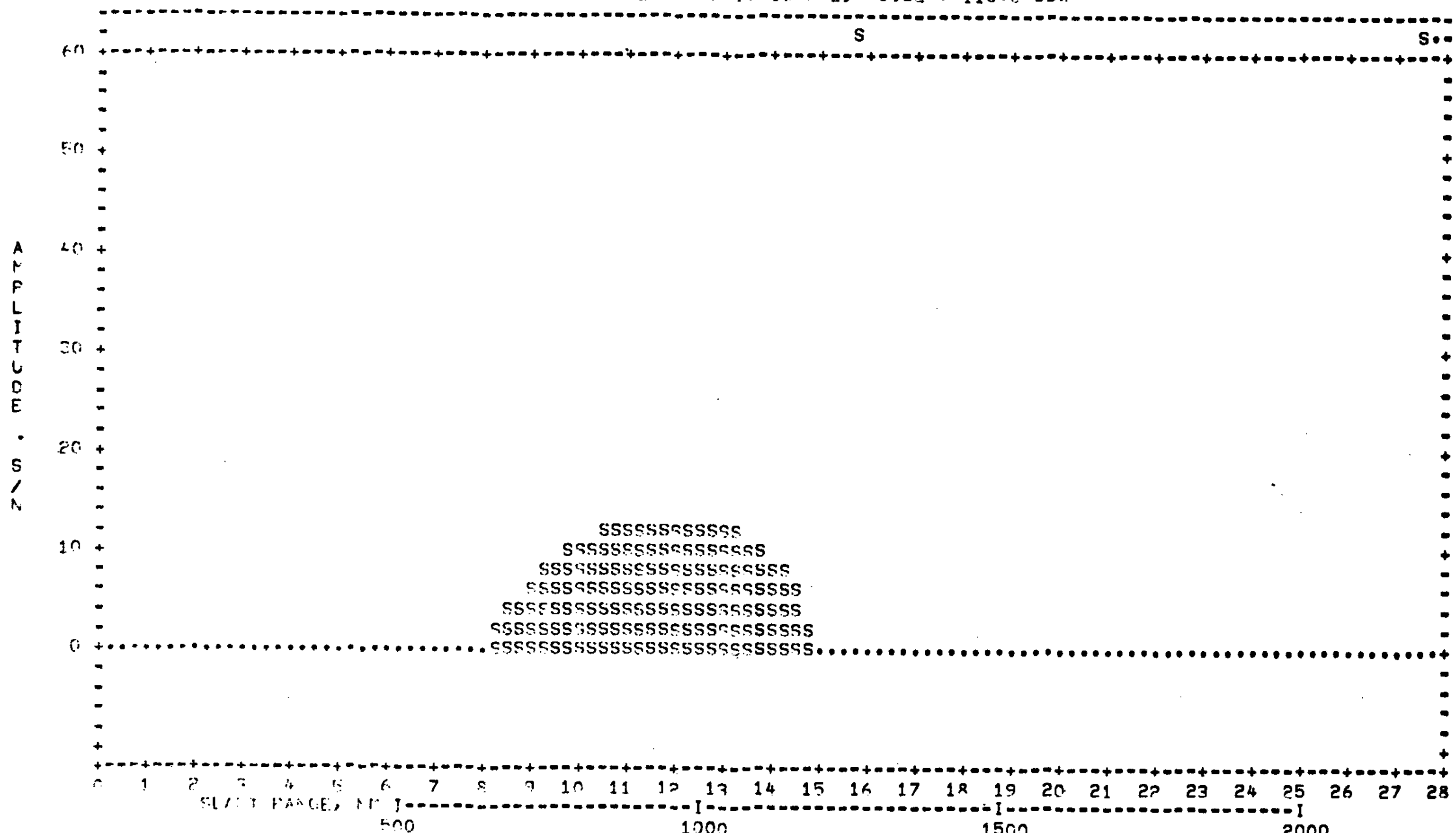
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 18.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	110.0	110.0
GROUND DISTANCE KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	1269.4	1259.7

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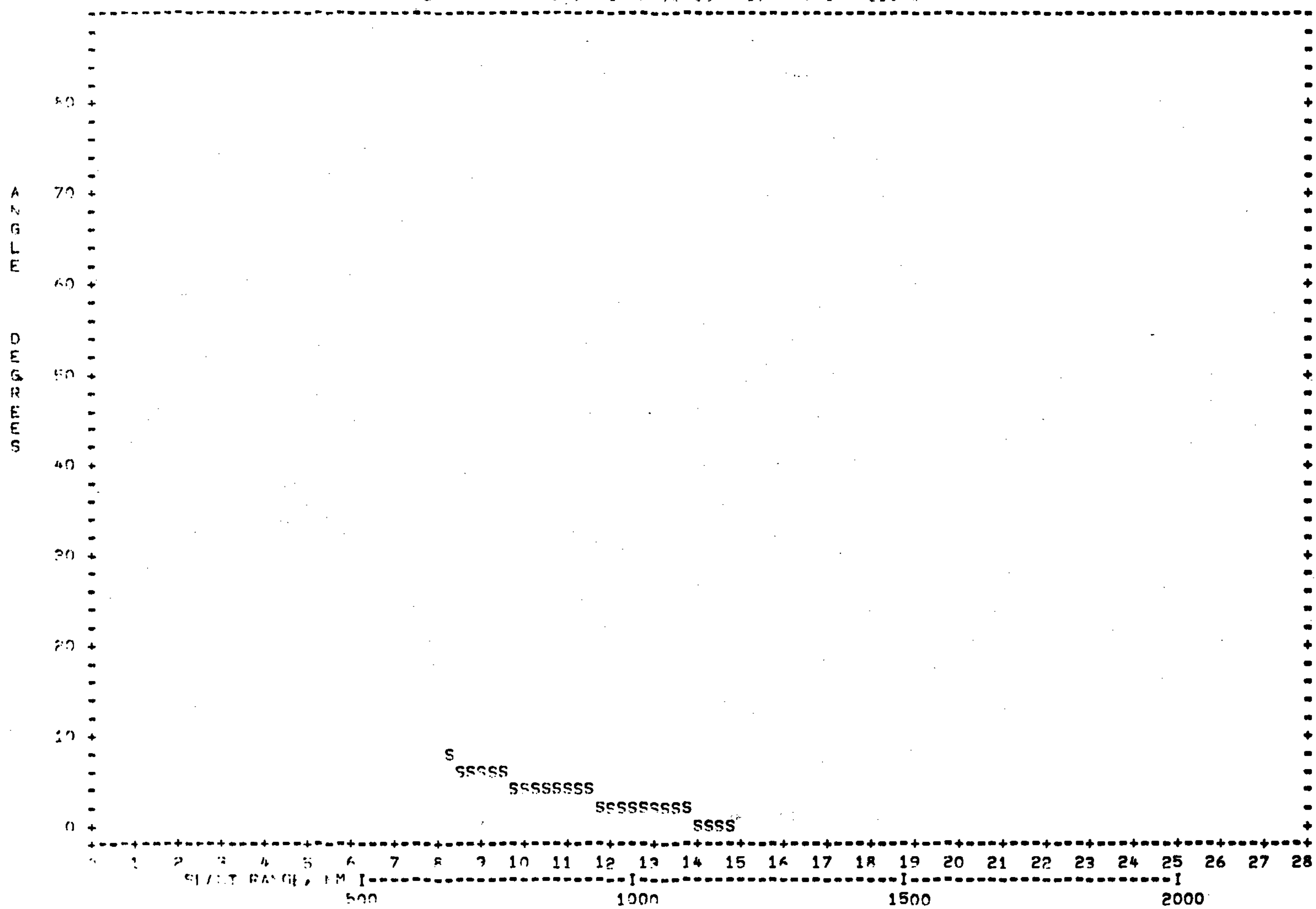
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 18.00 MHZ, NOISE = 110.0 DBW



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JUL SSN 43 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 18.00 MHZ [redacted]

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDKM	ABS	FREE	ANT	BEAM	AREA	BACK	ABF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.2	.0	.0	.0	110.	1269.	38.9	250.2	-31.0	7.0	5232.	70.7	.0	249.	17.0	69.9	.000	-179.	1284.
31.7	.0	.0	.0	110.	2539.	84.2	262.2	-31.0	7.0	10464.	73.7	.0	310.	17.0	69.9	.000	-240.	2568.
14.4	1.0	1.0	.0	110.	1155.	39.1	248.5	13.0	7.0	4766.	70.3	.0	204.	17.0	69.9	.001	-134.	1169.
28.9	1.0	1.0	.0	110.	2310.	84.7	260.5	13.0	7.0	9533.	73.3	.0	266.	17.0	69.9	.000	-199.	2339.
13.2	2.0	2.0	.0	110.	1052.	39.8	246.9	23.8	7.0	4347.	69.9	.0	193.	17.0	69.9	.005	-123.	1066.
26.3	2.0	2.0	.0	110.	2103.	86.2	258.9	23.8	7.0	8694.	72.9	.0	255.	17.0	69.9	.000	-190.	2132.
12.0	3.0	3.0	.0	110.	959.	40.8	245.3	30.0	7.0	3972.	69.5	.0	187.	17.0	69.9	.010	-117.	973.
24.1	3.0	3.0	.0	110.	1918.	88.8	257.3	30.0	7.0	7944.	72.5	.0	250.	17.0	69.9	.000	-185.	1947.
11.[illegible]	4.0	4.0	.0	110.	876.	42.3	243.8	34.0	7.0	3639.	69.1	.0	183.	17.0	69.9	.016	-113.	891.
22.[illegible]	4.0	4.0	.0	110.	1752.	92.6	255.8	34.0	7.0	7278.	72.1	.0	249.	17.0	69.9	.000	-184.	1782.
10.1	5.0	5.0	.0	110.	802.	44.3	242.3	37.4	7.0	3344.	68.8	.0	180.	17.0	69.9	.021	-111.	817.
20.2	5.0	5.0	.0	110.	1605.	97.6	254.3	37.4	7.0	6688.	71.8	.0	250.	17.0	69.9	.000	-184.	1635.
9.3	6.0	6.0	.0	110.	737.	46.8	240.9	41.0	7.0	3084.	68.4	.0	178.	17.0	69.9	.027	-108.	753.
18.6	6.0	6.0	.0	110.	1474.	104.2	252.9	41.0	7.0	6167.	71.4	.0	251.	17.0	69.9	.000	-185.	1505.
8.6	7.0	7.0	.0	110.	679.	50.1	239.5	42.4	7.0	2854.	68.1	.0	179.	17.0	69.9	.025	-109.	695.
17.2	7.0	7.0	.0	110.	1359.	112.6	251.5	42.4	7.0	5708.	71.1	.0	257.	17.0	69.9	.000	-191.	1390.
8.0	8.0	8.0	.0	110.	628.	54.1	238.2	45.0	7.0	2651.	67.8	.0	179.	17.0	69.9	.023	-110.	644.
15.[illegible]	8.0	8.0	.0	110.	1256.	123.2	250.2	45.0	7.0	5302.	70.8	.0	264.	17.0	69.9	.000	-198.	1288.
7.4	9.0	9.0	.0	110.	583.	59.0	236.9	45.8	7.0	2472.	67.5	.0	183.	17.0	69.9	.016	-113.	599.
14.[illegible]	9.0	9.0	.0	110.	1165.	136.4	248.9	45.8	7.0	4944.	70.5	.0	276.	17.0	69.9	.000	-209.	1198.
6.9	10.0	10.0	.0	110.	542.	65.0	235.7	47.0	7.0	2314.	67.2	.0	187.	17.0	69.9	.010	-117.	559.
13.[illegible]	10.0	10.0	.0	110.	1084.	152.9	247.7	47.0	7.0	4628.	70.2	.0	290.	17.0	69.9	.000	-223.	1118.
6.5	11.0	11.0	.0	110.	506.	72.4	234.6	47.4	7.0	2174.	66.9	.0	193.	17.0	69.9	.005	-123.	524.
12.[illegible]	11.0	11.0	.0	110.	1012.	173.5	246.6	47.4	7.0	4347.	69.9	.0	310.	17.0	69.9	.000	-242.	1047.
6.1	12.0	12.0	.0	110.	473.	81.4	233.5	48.8	7.0	2049.	66.6	.0	199.	17.0	69.9	.002	-130.	492.
12.2	12.0	12.0	.0	110.	947.	199.4	245.5	48.8	7.0	4098.	69.6	.0	333.	17.0	69.9	.000	-266.	984.
5.7	13.0	13.0	.0	110.	444.	92.6	232.4	48.8	7.0	1938.	66.4	.0	210.	17.0	69.9	.001	-140.	463.
11.4	13.0	13.0	.0	110.	888.	232.0	244.4	48.8	7.0	3876.	69.4	.0	365.	17.0	69.9	.000	-298.	927.
5.4	14.0	14.0	.0	110.	418.	106.3	231.5	49.0	7.0	1839.	66.2	.0	223.	17.0	69.9	.000	-153.	438.
10.8	14.0	14.0	.0	110.	836.	273.5	243.5	49.0	7.0	3677.	69.2	.0	406.	17.0	69.9	.000	-338.	876.
5.1	15.0	15.0	.0	110.	394.	127.3	230.5	49.0	7.0	1759.	66.0	.0	239.	17.0	69.9	.000	-169.	415.
10.2	15.0	15.0	.0	110.	788.	326.6	242.5	49.0	7.0	3499.	69.0	.0	458.	17.0	69.9	.000	-390.	829.
4.9	16.0	16.0	.0	110.	372.	144.5	229.6	48.8	7.0	1670.	65.8	.0	260.	17.0	69.9	.000	-190.	394.
9.7	16.0	16.0	.0	110.	745.	395.0	241.6	48.8	7.0	3339.	68.8	.0	526.	17.0	69.9	.000	-458.	788.
4.6	17.0	17.0	.0	110.	353.	171.1	228.8	48.6	7.0	1598.	65.6	.0	286.	17.0	69.9	.000	-216.	375.
9.2	17.0	17.0	.0	110.	705.	484.0	240.8	48.6	7.0	3195.	68.6	.0	614.	17.0	69.9	.000	-546.	750.
4.4	18.0	18.0	.0	110.	335.	204.6	228.0	48.0	7.0	1533.	65.4	.0	319.	17.0	69.9	.000	-249.	358.
8.8	18.0	18.0	.0	110.	669.	600.8	240.0	48.0	7.0	3065.	68.4	.0	731.	17.0	69.9	.000	-663.	715.
4.2	19.0	19.0	.0	110.	318.	247.1	227.2	47.4	7.0	1474.	65.2	.0	362.	17.0	69.9	.000	-292.	342.
8.4	19.0	19.0	.0	110.	636.	694.9	239.2	47.4	7.0	2948.	68.2	.0	825.	17.0	69.9	.000	-757.	684.
4.0	20.0	20.0	.0	110.	303.	301.4	226.4	46.8	7.0	1421.	65.1	.0	416.	17.0	69.9	.000	-346.	328.
8.1	20.0	20.0	.0	110.	605.	749.2	238.4	46.8	7.0	2841.	68.1	.0	879.	17.0	69.9	.000	-811.	655.
3.9	21.0	21.0	.0	110.	289.	371.1	225.7	45.4	7.0	1372.	64.9	.0	487.	17.0	69.9	.000	-417.	314.
7.[illegible]	21.0	21.0	.0	110.	577.	813.9	237.7	45.4	7.0	2744.	67.9	.0	950.	17.0	69.9	.000	-882.	629.
3.7	22.0	22.0	.0	110.	276.	447.8	225.0	44.0	7.0	1328.	64.8	.0	564.	17.0	69.9	.000	-494.	302.
7.5	22.0	22.0	.0	110.	551.	895.6	237.0	44.0	7.0	2656.	67.8	.0	1028.	17.0	69.9	.000	-959.	604.
3.[illegible]	23.0	23.0	.0	110.	263.	447.8	224.4	42.4	7.0	1288.	64.6	.0	565.	17.0	69.9	.000	-495.	291.
7.2	23.0	23.0	.0	110.	527.	895.6	236.4	42.4	7.0	2576.	67.6	.0	1029.	17.0	69.9	.000	-960.	582.
3.5	24.0	24.0	.0	110.	252.	447.8	223.7	41.0	7.0	1251.	64.5	.0	566.	17.0	69.9	.000	-496.	281.
6.[illegible]	24.0	24.0	.0	110.	504.	895.6	235.7	41.0	7.0	2503.	67.5	.0	1030.	17.0	69.9	.000	-961.	561.
3.[illegible]	25.0	25.0	.0	110.	241.	447.8	223.1	38.6	7.0	1218.	64.4	.0	568.	17.0	69.9	.000	-498.	271.
6.7	25.0	25.0	.0	110.	482.	395.6	235.1	38.6	7.0	2436.	67.4	.0	1031.	17.0	69.9	.000	-963.	542.

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3.2	26.0	26.0	.0	110.	232.	447.8	222.5	36.6	7.0	1188.	64.3	.0	569.	17.0	69.9	.000	-500.	262.
6.5	26.0	26.0	.0	110.	463.	895.6	234.5	36.6	7.0	2376.	67.3	.0	1033.	17.0	69.9	.000	-965.	524.
3.1	27.0	27.0	.0	110.	222.	447.8	222.0	33.4	7.0	1160.	64.2	.0	572.	17.0	69.9	.000	-502.	254.
6.3	27.0	27.0	.0	110.	444.	895.6	234.0	33.4	7.0	2320.	67.2	.0	1036.	17.0	69.9	.000	-967.	507.
3.0	28.0	28.0	.0	110.	213.	447.8	221.4	30.8	7.0	1135.	64.1	.0	574.	17.0	69.9	.000	-504.	246.
6.1	28.0	28.0	.0	110.	427.	895.6	233.4	30.8	7.0	2270.	67.1	.0	1038.	17.0	69.9	.000	-969.	492.
2.9	29.0	29.0	.0	110.	205.	447.8	220.9	28.8	7.0	1112.	64.0	.0	576.	17.0	69.9	.000	-506.	239.
5.9	29.0	29.0	.0	110.	410.	895.6	232.9	28.8	7.0	2224.	67.0	.0	1039.	17.0	69.9	.000	-971.	477.
2.9	30.0	30.0	.0	110.	197.	447.8	220.4	24.6	7.0	1091.	63.9	.0	580.	17.0	69.9	.000	-510.	232.
5.7	30.0	30.0	.0	110.	395.	895.6	232.4	24.6	7.0	2182.	66.9	.0	1043.	17.0	69.9	.000	-975.	464.

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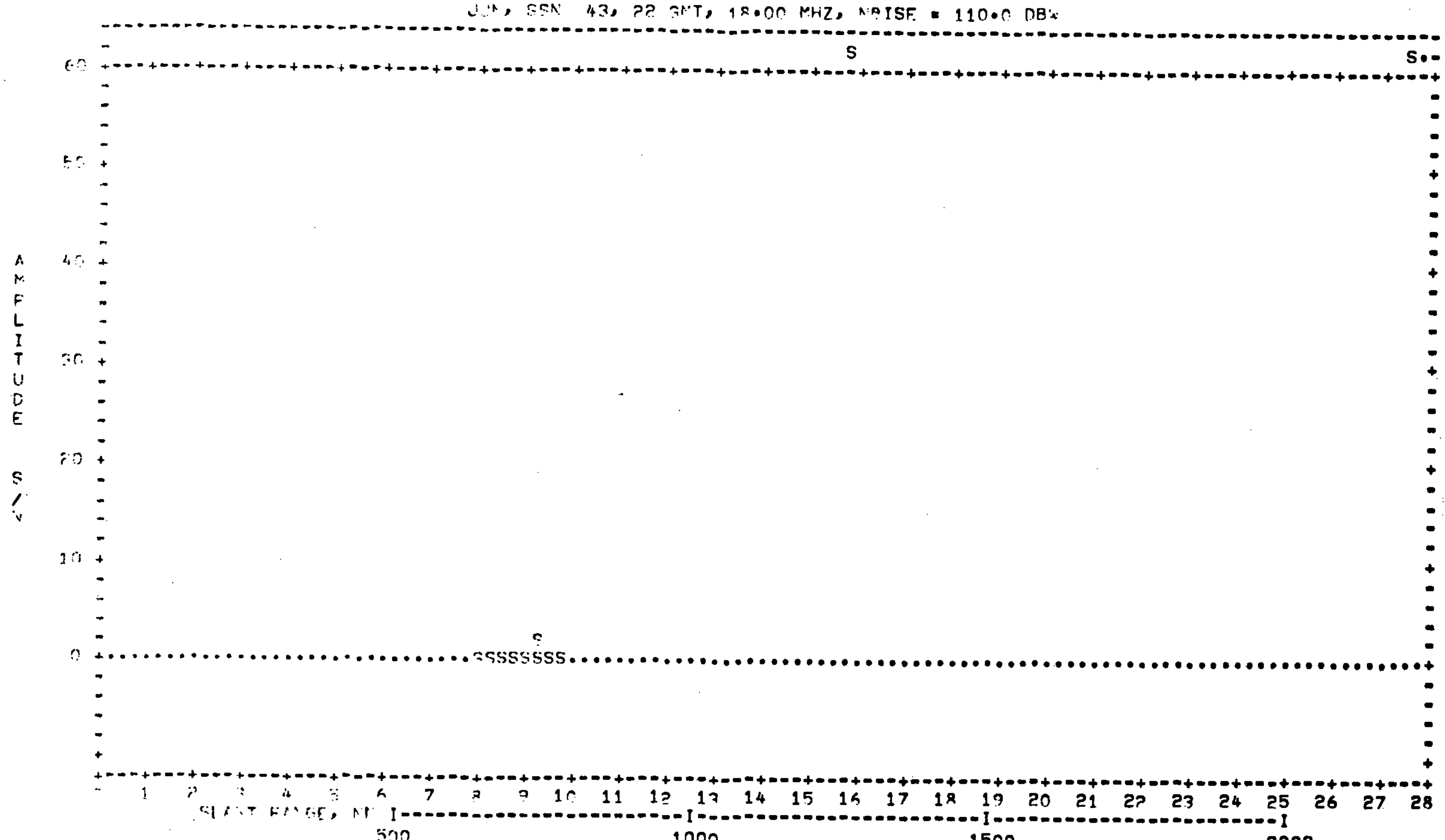
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 18.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY (MILLI SEC)	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	110.0	110.0
GROUND DISTANCE KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	1371.3	1360.7

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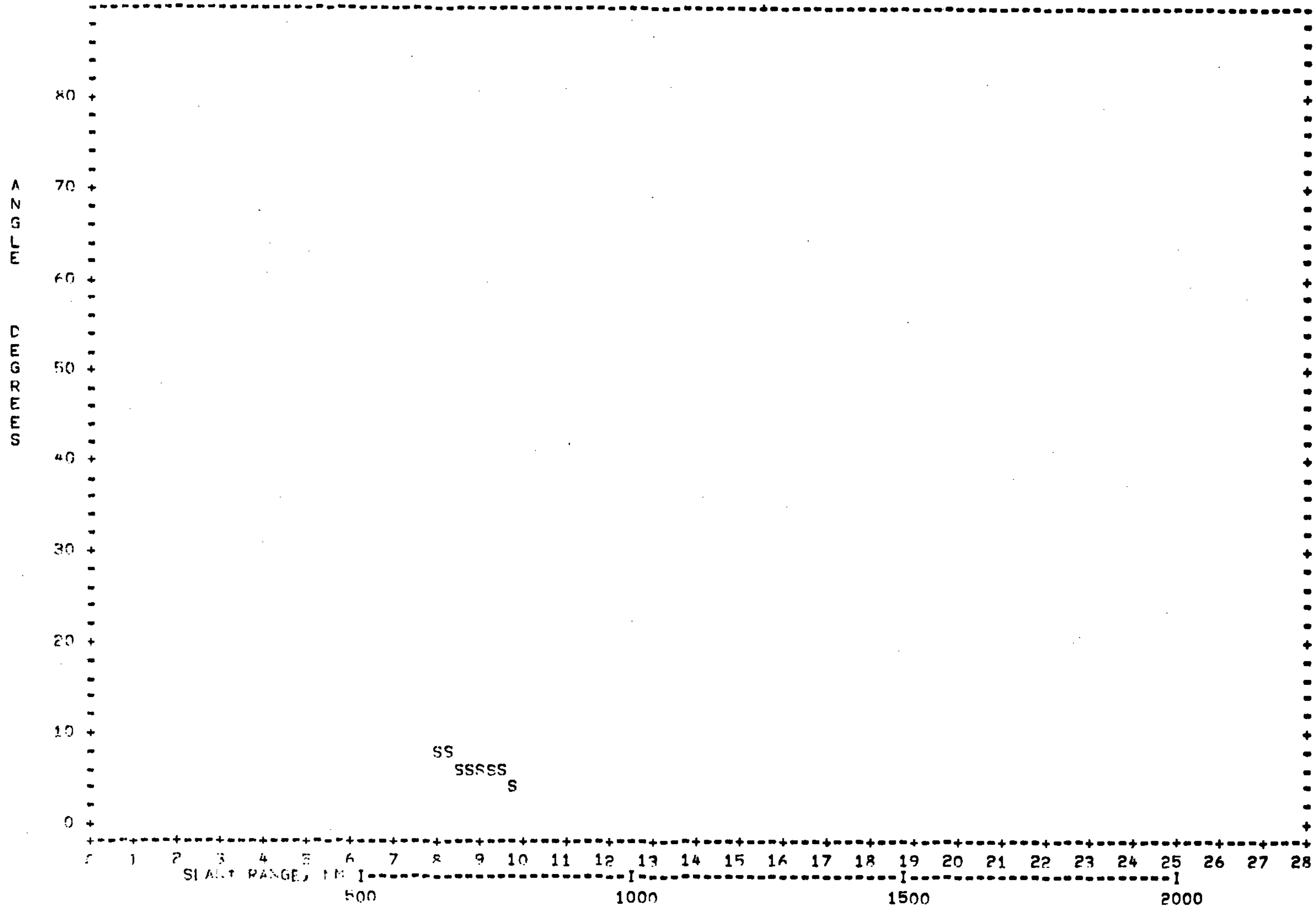
ANGLE COVERAGE, ELEVATION ANGLE VS TIME DELAY

PEAK PWR = 10.0 MW, ANT. = HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 18.00 MHZ, NOISE = 110.0 DBW



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JUL 55 48 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= VERT TAR = 0 SQ KM 23.00 MHZ

ES-LAYER, 1-HOP

TIME	DEL1	DEL2	TILT	HITE	GCDSM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1269.	56.6	254.4	25.0	7.0	5232.	72.8	.0	213.	17.0	69.9	.000	-143.	1284.
31.7	.0	.0	.0	110.	2539.	129.9	266.4	25.0	7.0	10464.	75.8	.0	302.	17.0	69.9	.000	-232.	2568.
14.4	1.0	1.0	.0	110.	1155.	57.1	252.8	44.6	7.0	4766.	72.4	.0	193.	17.0	69.9	.005	-123.	1169.
28.9	1.0	1.0	.0	110.	2310.	131.2	264.8	44.6	7.0	9533.	75.4	.0	283.	17.0	69.9	.000	-216.	2339.
13.2	2.0	2.0	.0	110.	1052.	58.6	251.2	49.0	7.0	4347.	72.0	.0	189.	17.0	69.9	.008	-119.	1066.
26.3	2.0	2.0	.0	110.	2103.	135.2	263.2	49.0	7.0	8694.	75.0	.0	281.	17.0	69.9	.000	-216.	2132.
12.0	3.0	3.0	.0	110.	959.	61.1	249.6	49.8	7.0	3972.	71.6	.0	189.	17.0	69.9	.008	-119.	973.
24.1	3.0	3.0	.0	110.	1918.	142.1	261.6	49.8	7.0	7944.	74.6	.0	286.	17.0	69.9	.000	-221.	1947.
11.0	4.0	4.0	.0	110.	876.	64.8	248.1	49.4	7.0	3639.	71.3	.0	192.	17.0	69.9	.005	-122.	891.
22.1	4.0	4.0	.0	110.	1752.	152.4	260.1	49.4	7.0	7278.	74.3	.0	296.	17.0	69.9	.000	-230.	1782.
10.1	5.0	5.0	.0	110.	802.	70.0	246.6	48.8	7.0	3344.	70.9	.0	197.	17.0	69.9	.003	-127.	817.
20.2	5.0	5.0	.0	110.	1605.	166.7	258.6	48.8	7.0	6688.	73.9	.0	309.	17.0	69.9	.000	-244.	1635.
9.3	6.0	6.0	.0	110.	737.	76.9	245.1	47.6	7.0	3084.	70.5	.0	204.	17.0	69.9	.001	-134.	753.
18.6	6.0	6.0	.0	110.	1474.	186.2	257.1	47.6	7.0	6167.	73.5	.0	329.	17.0	69.9	.000	-263.	1505.
8.7	7.0	7.0	.0	110.	679.	85.9	243.8	46.0	7.0	2854.	70.2	.0	213.	17.0	69.9	.000	-144.	695.
17.2	7.0	7.0	.0	110.	1359.	212.3	255.8	46.0	7.0	5708.	73.2	.0	356.	17.0	69.9	.000	-290.	1390.
8.0	8.0	8.0	.0	110.	628.	97.7	242.4	43.6	7.0	2651.	69.9	.0	227.	17.0	69.9	.000	-157.	644.
15.9	8.0	8.0	.0	110.	1256.	247.3	254.4	43.6	7.0	5302.	72.9	.0	392.	17.0	69.9	.000	-326.	1288.
7.4	9.0	9.0	.0	110.	583.	113.0	241.2	41.4	7.0	2472.	69.6	.0	243.	17.0	69.9	.000	-173.	599.
14.8	9.0	9.0	.0	110.	1165.	294.2	253.2	41.4	7.0	4944.	72.6	.0	440.	17.0	69.9	.000	-374.	1198.
6.9	10.0	10.0	.0	110.	542.	133.0	240.0	40.6	7.0	2314.	69.3	.0	263.	17.0	69.9	.000	-193.	559.
13.8	10.0	10.0	.0	110.	1084.	357.6	252.0	40.6	7.0	4628.	72.3	.0	503.	17.0	69.9	.000	-437.	1118.
6.5	11.0	11.0	.0	110.	506.	159.4	238.8	40.6	7.0	2174.	69.0	.0	289.	17.0	69.9	.000	-219.	524.
12.9	11.0	11.0	.0	110.	1012.	444.4	250.8	40.6	7.0	4347.	72.0	.0	589.	17.0	69.9	.000	-522.	1047.
6.1	12.0	12.0	.0	110.	473.	194.4	237.7	39.8	7.0	2049.	68.8	.0	324.	17.0	69.9	.000	-254.	492.
12.2	12.0	12.0	.0	110.	947.	564.6	249.7	39.8	7.0	4098.	71.8	.0	710.	17.0	69.9	.000	-642.	984.
5.7	13.0	13.0	.0	110.	444.	241.3	236.7	39.0	7.0	1938.	68.5	.0	370.	17.0	69.9	.000	-301.	463.
11.4	13.0	13.0	.0	110.	888.	689.1	248.7	39.0	7.0	3876.	71.5	.0	834.	17.0	69.9	.000	-767.	927.
5.4	14.0	14.0	.0	110.	418.	304.8	235.7	37.4	7.0	1839.	68.3	.0	435.	17.0	69.9	.000	-365.	438.
10.8	14.0	14.0	.0	110.	836.	752.6	247.7	37.4	7.0	3677.	71.3	.0	898.	17.0	69.9	.000	-831.	876.
5.1	15.0	15.0	.0	110.	394.	392.0	234.8	34.6	7.0	1750.	68.1	.0	524.	17.0	69.9	.000	-454.	415.
10.2	15.0	15.0	.0	110.	788.	839.8	246.8	34.6	7.0	3499.	71.1	.0	988.	17.0	69.9	.000	-920.	829.
4.9	16.0	16.0	.0	110.	372.	447.8	233.9	33.0	7.0	1670.	67.9	.0	581.	17.0	69.9	.000	-511.	394.
9.7	16.0	16.0	.0	110.	745.	895.6	245.9	33.0	7.0	3339.	70.9	.0	1044.	17.0	69.9	.000	-977.	788.
4.6	17.0	17.0	.0	110.	353.	447.8	233.0	29.0	7.0	1598.	67.7	.0	584.	17.0	69.9	.000	-514.	375.
9.3	17.0	17.0	.0	110.	705.	895.6	245.0	29.0	7.0	3195.	70.7	.0	1048.	17.0	69.9	.000	-980.	750.
4.4	18.0	18.0	.0	110.	335.	447.8	232.2	26.0	7.0	1533.	67.5	.0	586.	17.0	69.9	.000	-517.	358.
8.8	18.0	18.0	.0	110.	669.	895.6	244.2	26.0	7.0	3065.	70.5	.0	1050.	17.0	69.9	.000	-982.	715.
4.2	19.0	19.0	.0	110.	318.	447.8	231.4	24.0	7.0	1474.	67.3	.0	588.	17.0	69.9	.000	-518.	342.
8.4	19.0	19.0	.0	110.	636.	895.6	243.4	24.0	7.0	2948.	70.3	.0	1051.	17.0	69.9	.000	-984.	684.
4.0	20.0	20.0	.0	110.	303.	447.8	230.7	21.0	7.0	1421.	67.2	.0	590.	17.0	69.9	.000	-520.	328.
8.1	20.0	20.0	.0	110.	605.	895.6	242.7	21.0	7.0	2841.	70.2	.0	1054.	17.0	69.9	.000	-986.	655.
3.8	21.0	21.0	.0	110.	289.	447.8	230.0	20.0	7.0	1372.	67.0	.0	591.	17.0	69.9	.000	-521.	314.
7.6	21.0	21.0	.0	110.	577.	895.6	242.0	20.0	7.0	2744.	70.0	.0	1054.	17.0	69.9	.000	-986.	629.
3.7	22.0	22.0	.0	110.	276.	447.8	229.3	19.0	7.0	1328.	66.9	.0	591.	17.0	69.9	.000	-521.	302.
7.5	22.0	22.0	.0	110.	551.	895.6	241.3	19.0	7.0	2656.	69.9	.0	1055.	17.0	69.9	.000	-987.	604.
3.6	23.0	23.0	.0	110.	263.	447.8	228.6	18.0	7.0	1288.	66.8	.0	592.	17.0	69.9	.000	-522.	291.
7.2	23.0	23.0	.0	110.	527.	895.6	240.6	18.0	7.0	2576.	69.8	.0	1055.	17.0	69.9	.000	-987.	582.
3.5	24.0	24.0	.0	110.	252.	447.8	228.0	16.0	7.0	1251.	66.6	.0	593.	17.0	69.9	.000	-523.	281.
6.9	24.0	24.0	.0	110.	504.	895.6	240.0	16.0	7.0	2503.	69.6	.0	1057.	17.0	69.9	.000	-989.	561.
3.3	25.0	25.0	.0	110.	241.	447.8	227.4	16.0	7.0	1218.	66.5	.0	593.	17.0	69.9	.000	-523.	271.
6.7	25.0	25.0	.0	110.	483.	895.6	239.4	16.0	7.0	2436.	69.5	.0	1056.	17.0	69.9	.000	-988.	542.

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3.2	26.0	26.0	.0	110.	232.	447.8	226.8	15.0	7.0	1188.	66.4	.0	593.	17.0	69.9	.000	-523.	262.
6.5	26.0	26.0	.0	110.	463.	895.6	238.8	15.0	7.0	2376.	69.4	.0	1057.	17.0	69.9	.000	-989.	524.
3.1	27.0	27.0	.0	110.	222.	447.8	226.2	13.8	7.0	1160.	66.3	.0	594.	17.0	69.9	.000	-524.	254.
6.2	27.0	27.0	.0	110.	444.	895.6	238.2	13.8	7.0	2320.	69.3	.0	1057.	17.0	69.9	.000	-989.	507.
3.0	28.0	28.0	.0	110.	213.	447.8	225.7	9.0	7.0	1135.	66.2	.0	598.	17.0	69.9	.000	-528.	246.
6.1	28.0	28.0	.0	110.	427.	895.6	237.7	9.0	7.0	2270.	69.2	.0	1062.	17.0	69.9	.000	-994.	492.
2.9	29.0	29.0	.0	110.	205.	447.8	225.2	8.0	7.0	1112.	66.1	.0	599.	17.0	69.9	.000	-529.	239.
5.9	29.0	29.0	.0	110.	410.	895.6	237.2	8.0	7.0	2224.	69.1	.0	1062.	17.0	69.9	.000	-994.	477.
2.9	30.0	30.0	.0	110.	197.	447.8	224.7	4.0	7.0	1091.	66.0	.0	602.	17.0	69.9	.000	-533.	232.
5.7	30.0	30.0	.0	110.	395.	895.6	236.7	4.0	7.0	2182.	69.0	.0	1066.	17.0	69.9	.000	-998.	464.

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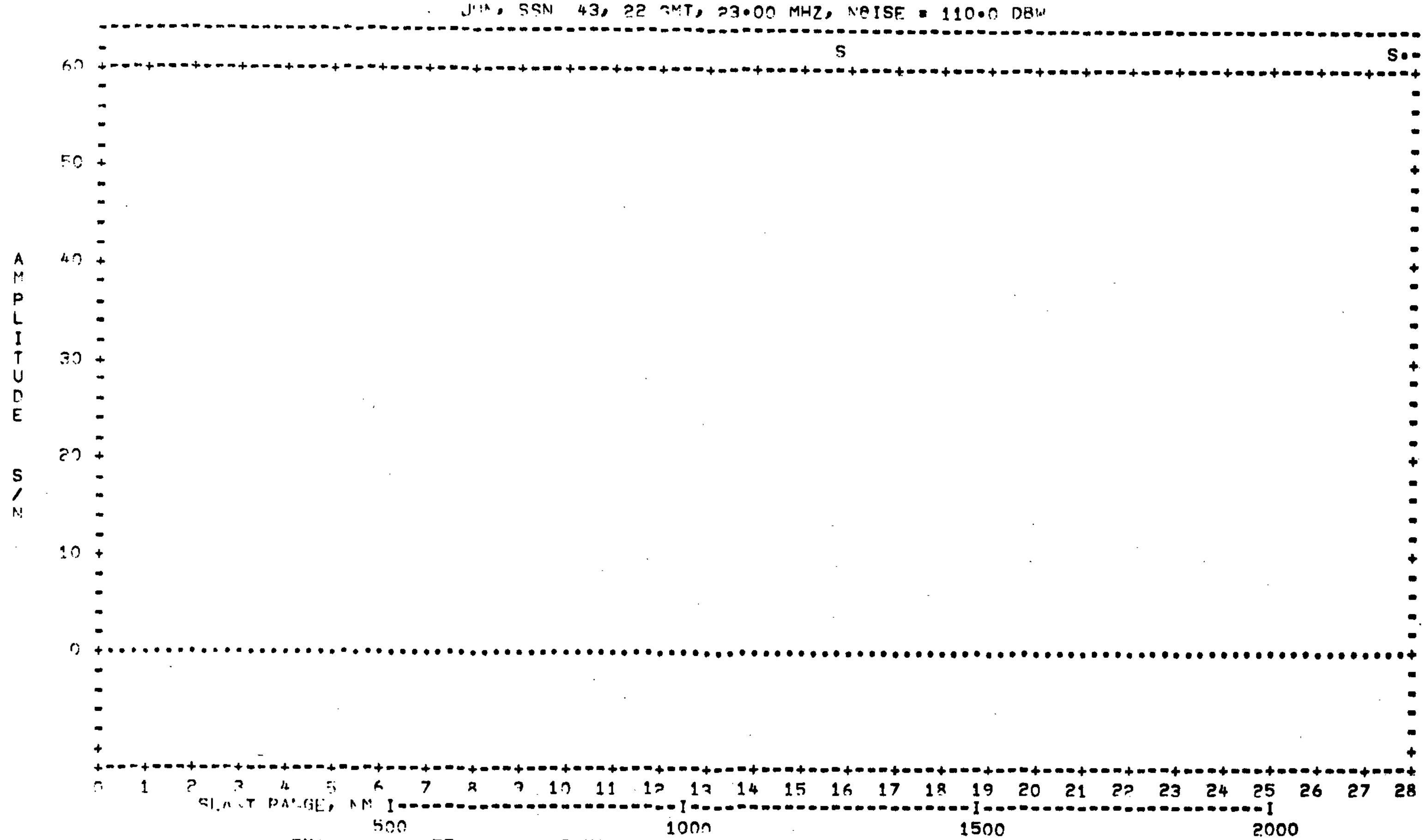
RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= VERT, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 23.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.0
VIRTUAL HEIGHT KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	110.0	110.0
GROUND DISTANCE KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	1269.4	1259.7

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JU [illegible] 22 GMT BEARING 65 DEG PULSE = .12 MS ANT.= HORZ TAR = 0 SQ KM 23.00 MHZ

ES-LAYER, 1-HOP

TIME	ANG1	ANG2	TILT	HITE	SCONM	ABS	FREE	ANT	BEAM	AREA	BACK	OBF	LOSS	IMP	PWR	VOLT	DBW	RANGE
15.9	.0	.0	.0	110.	1263.	56.6	254.4	-31.0	7.0	5232.	72.8	.0	269.	17.0	69.9	.000	-199.	1284.
31.7	.0	.0	.0	110.	2533.	123.9	266.4	-31.0	7.0	10464.	75.8	.0	358.	17.0	69.9	.000	-288.	2568.
14.4	1.0	1.0	.0	110.	1155.	57.1	252.8	13.0	7.0	4766.	72.4	.0	224.	17.0	69.9	.000	-155.	1169.
28.[illegible]	1.0	1.0	.0	110.	2310.	131.2	264.8	13.0	7.0	9533.	75.4	.0	314.	17.0	69.9	.000	-248.	2339.
13.2	2.0	2.0	.0	110.	1052.	53.6	251.2	23.8	7.0	4347.	72.0	.0	214.	17.0	69.9	.000	-144.	1066.
26.3	2.0	2.0	.0	110.	2103.	135.2	263.2	23.8	7.0	8694.	75.0	.0	306.	17.0	69.9	.000	-241.	2132.
12.[illegible]	3.0	3.0	.0	110.	959.	61.1	249.6	30.0	7.0	3972.	71.6	.0	209.	17.0	69.9	.001	-139.	973.
24.1	3.0	3.0	.0	110.	1918.	142.1	261.6	30.0	7.0	7944.	74.6	.0	306.	17.0	69.9	.000	-241.	1947.
11.[illegible]	4.0	4.0	.0	110.	876.	64.8	248.1	34.0	7.0	3639.	71.3	.0	208.	17.0	69.9	.001	-138.	891.
22.[illegible]	4.0	4.0	.0	110.	1752.	152.4	260.1	34.0	7.0	7278.	74.3	.0	311.	17.0	69.9	.000	-246.	1782.
10.1	5.0	5.0	.0	110.	802.	70.0	246.6	37.4	7.0	3344.	70.9	.0	208.	17.0	69.9	.001	-138.	817.
20.2	5.0	5.0	.0	110.	1605.	166.7	258.6	37.4	7.0	6688.	73.9	.0	321.	17.0	69.9	.000	-255.	1635.
9.3	6.0	6.0	.0	110.	737.	76.9	245.1	41.0	7.0	3084.	70.5	.0	210.	17.0	69.9	.001	-141.	753.
18.5	6.0	6.0	.0	110.	1474.	186.2	257.1	41.0	7.0	6167.	73.5	.0	336.	17.0	69.9	.000	-270.	1505.
8.6	7.0	7.0	.0	110.	679.	85.9	243.8	42.4	7.0	2854.	70.2	.0	217.	17.0	69.9	.000	-147.	695.
17.2	7.0	7.0	.0	110.	1359.	212.3	255.8	42.4	7.0	5708.	73.2	.0	359.	17.0	69.9	.000	-293.	1390.
8.[illegible]	8.0	8.0	.0	110.	623.	97.7	242.4	45.0	7.0	2651.	69.9	.0	225.	17.0	69.9	.000	-155.	644.
15.[illegible]	8.0	8.0	.0	110.	1256.	247.3	254.4	45.0	7.0	5302.	72.9	.0	391.	17.0	69.9	.000	-324.	1288.
7.4	9.0	9.0	.0	110.	583.	113.0	241.2	45.8	7.0	2472.	69.6	.0	239.	17.0	69.9	.000	-169.	599.
14.[illegible]	9.0	9.0	.0	110.	1165.	294.2	253.2	45.8	7.0	4944.	72.6	.0	436.	17.0	69.9	.000	-369.	1198.
6.9	10.0	10.0	.0	110.	542.	133.0	240.0	47.0	7.0	2314.	69.3	.0	257.	17.0	69.9	.000	-187.	559.
13.[illegible]	10.0	10.0	.0	110.	1084.	357.6	252.0	47.0	7.0	4628.	72.3	.0	497.	17.0	69.9	.000	-430.	1118.
6.5	11.0	11.0	.0	110.	506.	159.4	238.8	47.4	7.0	2174.	69.0	.0	282.	17.0	69.9	.000	-212.	524.
12.[illegible]	11.0	11.0	.0	110.	1012.	444.4	250.8	47.4	7.0	4347.	72.0	.0	583.	17.0	69.9	.000	-516.	1047.
6.1	12.0	12.0	.0	110.	473.	194.4	237.7	48.8	7.0	2049.	68.8	.0	315.	17.0	69.9	.000	-245.	492.
12.2	12.0	12.0	.0	110.	947.	564.6	249.7	48.8	7.0	4098.	71.8	.0	701.	17.0	69.9	.000	-633.	984.
5.7	13.0	13.0	.0	110.	444.	241.3	236.7	48.8	7.0	1938.	68.5	.0	361.	17.0	69.9	.000	-291.	463.
11.4	13.0	13.0	.0	110.	888.	683.1	248.7	48.8	7.0	3876.	71.5	.0	824.	17.0	69.9	.000	-757.	927.
5.4	14.0	14.0	.0	110.	413.	304.8	235.7	49.0	7.0	1839.	68.3	.0	423.	17.0	69.9	.000	-353.	438.
10.8	14.0	14.0	.0	110.	836.	752.6	247.7	49.0	7.0	3677.	71.3	.0	887.	17.0	69.9	.000	-819.	876.
5.1	15.0	15.0	.0	110.	394.	392.0	234.8	49.0	7.0	1750.	68.1	.0	510.	17.0	69.9	.000	-440.	415.
10.2	15.0	15.0	.0	110.	788.	839.8	246.8	49.0	7.0	3499.	71.1	.0	973.	17.0	69.9	.000	-906.	829.
4.9	16.0	16.0	.0	110.	372.	447.8	233.9	48.8	7.0	1670.	67.9	.0	565.	17.0	69.9	.000	-495.	394.
9.7	16.0	16.0	.0	110.	745.	895.6	245.9	48.8	7.0	3339.	70.9	.0	1029.	17.0	69.9	.000	-961.	788.
4.5	17.0	17.0	.0	110.	353.	447.8	233.0	48.6	7.0	1598.	67.7	.0	565.	17.0	69.9	.000	-495.	375.
9.3	17.0	17.0	.0	110.	705.	895.6	245.0	48.6	7.0	3195.	70.7	.0	1028.	17.0	69.9	.000	-960.	750.
4.4	18.0	18.0	.0	110.	335.	447.8	232.2	48.0	7.0	1533.	67.5	.0	564.	17.0	69.9	.000	-495.	358.
8.[illegible]	18.0	18.0	.0	110.	669.	895.6	244.2	48.0	7.0	3065.	70.5	.0	1028.	17.0	69.9	.000	-960.	715.
4.2	19.0	19.0	.0	110.	313.	447.8	231.4	47.4	7.0	1474.	67.3	.0	564.	17.0	69.9	.000	-495.	342.
8.4	19.0	19.0	.0	110.	636.	895.6	243.4	47.4	7.0	2948.	70.3	.0	1028.	17.0	69.9	.000	-960.	684.
4.[illegible]	20.0	20.0	.0	110.	303.	447.8	230.7	46.8	7.0	1421.	67.2	.0	565.	17.0	69.9	.000	-495.	328.
8.1	20.0	20.0	.0	110.	605.	895.6	242.7	46.8	7.0	2841.	70.2	.0	1028.	17.0	69.9	.000	-960.	655.
3.9	21.0	21.0	.0	110.	289.	447.8	230.0	45.4	7.0	1372.	67.0	.0	565.	17.0	69.9	.000	-495.	314.
7.[illegible]	21.0	21.0	.0	110.	577.	895.6	242.0	45.4	7.0	2744.	70.0	.0	1029.	17.0	69.9	.000	-961.	629.
3.7	22.0	22.0	.0	110.	276.	447.8	229.3	44.0	7.0	1328.	66.9	.0	566.	17.0	69.9	.000	-496.	302.
7.5	22.0	22.0	.0	110.	551.	895.6	241.3	44.0	7.0	2656.	69.9	.0	1030.	17.0	69.9	.000	-962.	604.
3.6	23.0	23.0	.0	110.	263.	447.8	228.6	42.4	7.0	1288.	66.8	.0	567.	17.0	69.9	.000	-497.	291.
7.2	23.0	23.0	.0	110.	527.	895.6	240.6	42.4	7.0	2576.	69.8	.0	1031.	17.0	69.9	.000	-963.	582.
3.[illegible]	24.0	24.0	.0	110.	252.	447.8	228.0	41.0	7.0	1251.	66.6	.0	568.	17.0	69.9	.000	-498.	281.
6.[illegible]	24.0	24.0	.0	110.	504.	895.6	240.0	41.0	7.0	2503.	69.6	.0	1032.	17.0	69.9	.000	-964.	561.
3.[illegible]	25.0	25.0	.0	110.	241.	447.8	227.4	38.6	7.0	1218.	66.5	.0	570.	17.0	69.9	.000	-500.	271.
6.7	25.0	25.0	.0	110.	483.	895.6	239.4	38.6	7.0	2436.	69.5	.0	1034.	17.0	69.9	.000	-965.	542.

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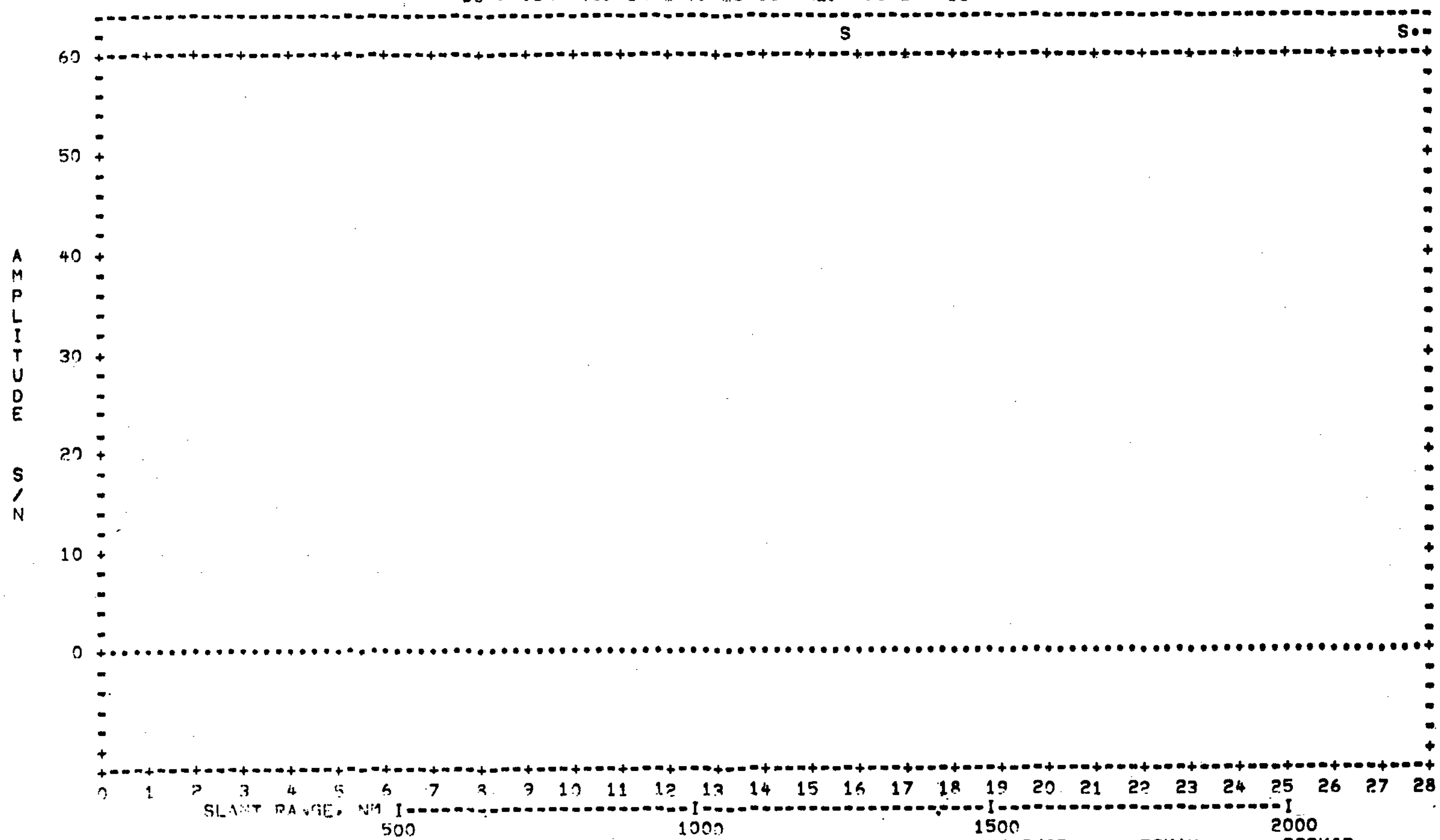
3.2	26.0	26.0	.0	110.	232.	447.8	226.8	36.6	7.0	1188.	66.4	.0	572.	17.0	69.9	.000	-502.	262.
6.5	26.0	26.0	.0	110.	463.	895.6	238.8	36.6	7.0	2376.	69.4	.0	1035.	17.0	69.9	.000	-967.	524.
3.1	27.0	27.0	.0	110.	222.	447.8	226.2	33.4	7.0	1160.	66.3	.0	574.	17.0	69.9	.000	-504.	254.
6.3	27.0	27.0	.0	110.	444.	395.6	238.2	33.4	7.0	2320.	69.3	.0	1038.	17.0	69.9	.000	-970.	507.
3.0	28.0	28.0	.0	110.	213.	447.8	225.7	30.8	7.0	1135.	66.2	.0	576.	17.0	69.9	.000	-507.	246.
6.1	28.0	28.0	.0	110.	427.	895.6	237.7	30.8	7.0	2270.	69.2	.0	1040.	17.0	69.9	.000	-972.	492.
2.9	29.0	29.0	.0	110.	205.	447.8	225.2	28.8	7.0	1112.	66.1	.0	578.	17.0	69.9	.000	-508.	239.
5.9	29.0	29.0	.0	110.	410.	895.6	237.2	28.8	7.0	2224.	69.1	.0	1042.	17.0	69.9	.000	-973.	477.
2.9	30.0	30.0	.0	110.	177.	447.8	224.7	24.6	7.0	1091.	66.0	.0	582.	17.0	69.9	.000	-512.	232.
5.7	30.0	30.0	.0	110.	395.	395.6	236.7	24.6	7.0	2182.	69.0	.0	1045.	17.0	69.9	.000	-977.	464.

RANGE COVERAGE, AMPLITUDE VS TIME DELAY

RADAR LOCATION 52.10 DEG LAT, -1.58 DEG LONG

PEAK PWR = 10.0 MW, ANT.= HORZ, PULSE = .12 MS, BEARING = 65 DEG

JUN, SSN 43, 22 GMT, 23.00 MHZ, NOISE = 110.0 DBW



	EMAX	ESKIP	F1MAX	F1SKIP	F2MAX	F2SKIP	ESMAX	ESSKIP
TIME DELAY MILLI SEC	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	15.9	15.7
TAKE OFF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
GROUND REF ANGLE	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.1
TILT	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	.0	.0
VIRTUAL HEIGHT,KM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	110.0	110.0
GROUND DISTANCE NM	0000.0	0000.0	0000.0	0000.0	0000.0	0000.0	1371.3	1360.7

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A good real time description of the ionospheric transmission path will be essential for effective operational use of the radar. The major purpose of this experiment is to explore analysis techniques that use echoes from the earth surface as a base to form a transmission description and thus to optimize radar operation and to evaluate radar performance. The essential step herein is to determine how to provide an adequate description of the transmission medium. The extent to which this description can be accomplished with only radar outputs will be examined and the necessary auxiliary ionospheric describers will be defined.

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